



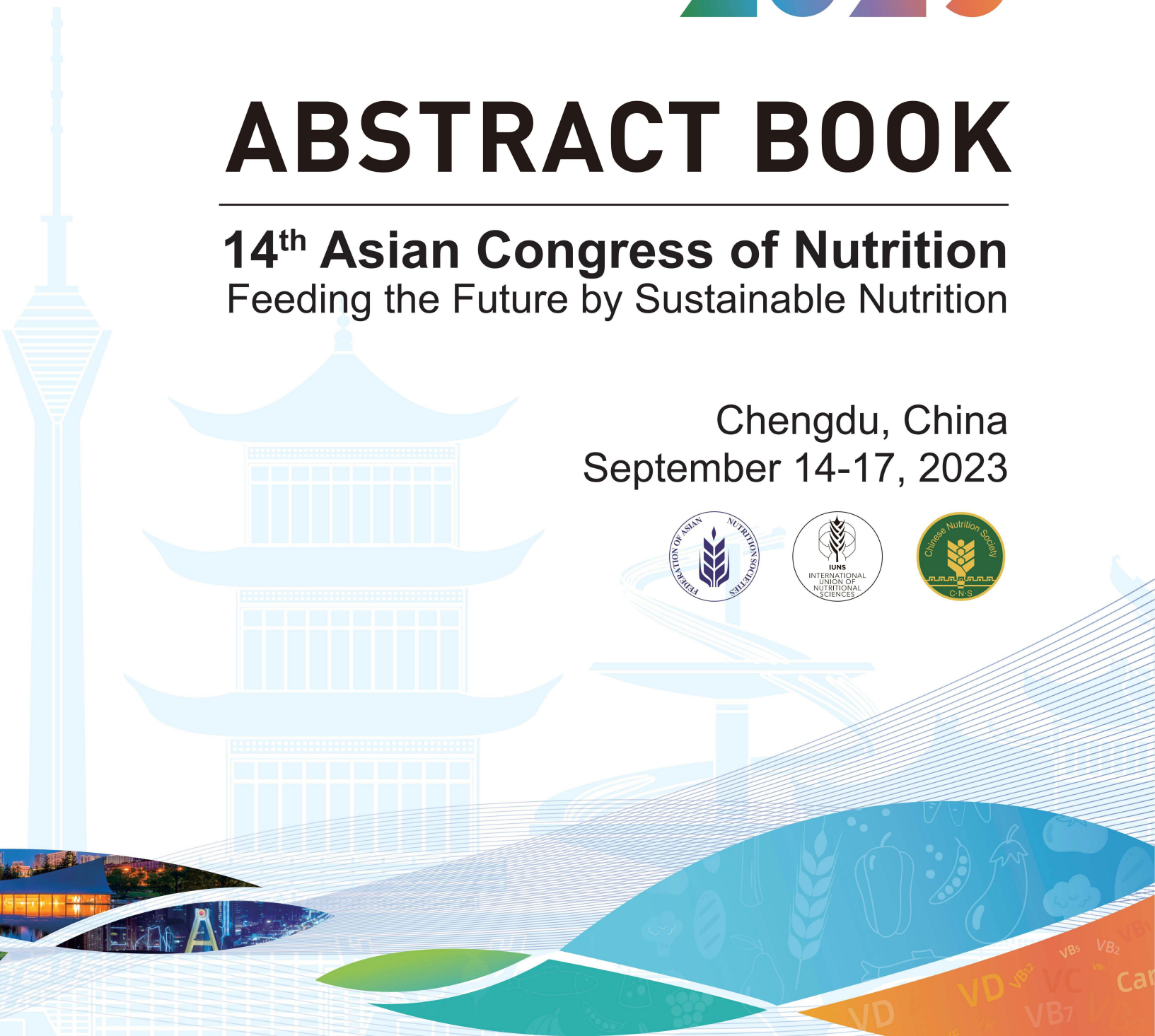
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# ABSTRACT BOOK

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# **Assessment of the role of Indian mustard honey in suppressing colon cancer progression by inhibiting cell proliferation and reversing drug sensitivity in 5-fluorouracil-resistant colon cancer cells**

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**Introduction:** Colon cancer is the most prevalent cause of death from cancer across globe. Although chemotherapy drugs are predominantly used but their toxicity always remains a question. As an alternative to synthetic drugs, natural compounds or nutraceuticals are comparatively less toxic. Honey is widely used across different cultures as an alternative form of medicine. It represents a prominent source of plant-phenolic compounds and has demonstrated evidences of anti-oxidant as well as anti-microbial activities. The aim of the present work was to investigate the anti-proliferative effect of some Indian honeys and their mechanism of action in colon cancer.

**Methods:** In order to establish the composition-activity relationship, we evaluated the bio-active components present in the selected honey samples by GC-MS and HPLC analysis. The apoptotic activities as imparted by the honey samples were established by AnnexinV/PI staining, Real Time PCR and immunoblot analysis. The cancer resistant condition was created by 5-FU treatment to cells

**Results:** Indian honey samples showed a significant inhibitory impact on cell growth by restricting cell proliferation, causing apoptosis, and restricting the cell cycle in G2/M phase specifically to colon cancer cells. The treated cells showed increased expressions of p53, caspase 3, 8 and 9 thus indicating the involvement of both extrinsic and intrinsic apoptotic pathways. The honey samples were also found to inhibit the  $\beta$ -catenin/ Wnt pathway. The last part of the study showed that mustard honey prevented metastasis and chemoresistance in colon cancer cells by involving LGR-5 as a potential target. We further demonstrated the efficacy of these honey samples in colon carcinoma induced SD rats where honey showed anti-cancer properties.

**Conclusions:** Overall, these findings demonstrate that Indian honey can be established as effective nutraceuticals for the prevention as well as cure of colon cancer.

**Key words** Honey, Nutraceuticals, Colorectal carcinoma, Cell death, Chemoresistance

## **Associations of dietary fat intake and visceral adiposity with cardiovascular disease risk markers in Sri Lankan healthy adults**

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### **Background and objectives:**

Sri Lankans consume more than the recommended intake of saturated fat (SFA), contributed from coconut fat, but the implications on cardiovascular disease (CVD) risk markers is still unclear. This study aimed to assess the associations between dietary fat intake with CVD risk markers in Sri Lankan adults.

### **Method:**

In the CocoHeart-Sri Lankan cross-sectional study, 401 healthy adults (243-males and 158-females; mean $\pm$ SD age 43 $\pm$ 8 years and BMI 24.2 $\pm$ 4.3kgm<sup>-2</sup>) had a measurement of arterial stiffness in terms of pulse wave velocity (PWV) and blood pressure using an oscillometric Mobil-O-Graph® PWA Monitor device. Body composition was measured using a multi-frequency segmental body composition analyzer. A fasting blood sample was collected to determine glycaemic and lipid biomarkers. Dietary intake was assessed using a 3-day diet diary. A general linear model and stepwise multiple linear regression model was performed to assess the impact of total fat intake on CVD risk markers and to identify their degree of variability explained by visceral adiposity.

### **Results:**

Fasting PWV, systolic blood pressure (SBP), triacylglycerol (TAG) and HOMA-IR index were mean ( $\pm$  SD or interquartile range) 6.5 ( $\pm$ 1.1) m/s, 122 (113-132) mmHg, 1.27 (0.95-1.74) mmol/l, and 1.90 (1.4-2.7), respectively. Total fat, SFA, polyunsaturated and monounsaturated fatty acid intakes as percentage of total energy ( $\pm$ SD or interquartile range) were 24.9% ( $\pm$ 5.4%), 16.3% ( $\pm$ 3.9%), 1.3% (1.0-1.6%) and 2.8% (2.2-3.5 %), respectively. Visceral adiposity was higher in Q4 quartile with higher fat intake compared to the other quartile groups (9.9,  $P=0.002$ ). In multiple linear regression analyses, visceral adiposity alone explained 2.1%, 10.6% and 11.1% of the variability in PWV, SBP and TAG, respectively.

### **Conclusion:**

In conclusion, higher intakes of dietary fat were associated with higher visceral adiposity. Visceral adiposity independently predicted about 11% of the variability in SBP and fasting TAG concentration.

**Key words** arterial stiffness, saturated fat, SBP, total fat, visceral adiposity

# The Association between Body Composition, Clinical Biomarkers and Type 2 Diabetes Progression: Early Findings from the TOFI\_Asia Cohort

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**Background and Objectives:** China shoulders the rising global cases of type 2 diabetes (T2D), which may occur when younger and at lower body mass index (BMI) than Caucasian counterparts. A key driver of increased susceptibility maybe accumulation of riskier abdominal visceral adipose tissue (VAT). However, longitudinal follow-up studies in age and BMI matched cohorts investigating association of clinical biomarkers and body composition in T2D progression are limited.

**Methods:** 204 individuals (117 Chinese: 44% male; 87 Caucasian: 46% male) from the Thin-on-the-Outside-Fat-on-the-Inside (TOFI)\_Asia baseline study were followed up after 3 years. Measurements conducted at baseline were repeated and included anthropometry, body composition using dual-energy x-ray absorptiometry and fasted blood for glycated haemoglobin (Hb<sub>A1c</sub>), plasma glucose (FPG) and lipids. Significant clinical biomarkers ( $p < 0.1$ ) in models adjusted for gender, ethnicity and follow-up duration were included in repeated measures mixed model to determine effects on FPG.

**Results:** Like baseline, at 3 years, Chinese were younger (mean, SD, age  $46 \pm 13$  vs.  $50 \pm 16$  years) yet had similar BMI ( $27.0 \pm 4.0$  vs.  $27.0 \pm 4.5$  kg/m<sup>2</sup>) to Caucasians, with greater abdominal VAT ( $43.6 \pm 17.5$  vs.  $39.7 \pm 20.6$  %). Based on FPG, at baseline, 73% were normoglycemic (79 Chinese, 70 Caucasian) while a quarter had prediabetes (38 Chinese, 17 Caucasian). However, at follow-up, 67% were normoglycemic (74 Chinese, 63 Caucasian), 30% had pre-diabetes with twice as many Chinese (40 vs 22 Caucasian), while 3% had progressed to T2D (3 Chinese, 2 Caucasian). Significant contributors of impaired FPG were hip circumference ( $p < 0.01$ ), VAT ( $p < 0.05$ ), triglyceride (TG,  $p < 0.0001$ ), low-density lipoprotein cholesterol (LDL-C,  $p < 0.001$ ) and Hb<sub>A1c</sub>, which was higher in Chinese at follow-up (Hb<sub>A1c</sub>\*ethnicity\*follow-up,  $p < 0.05$ ).

**Conclusion:** Early findings demonstrate the importance of lipid mediators and VAT in progression toward T2D irrespective of ethnicity and gender, with ethnic variability in Hb<sub>A1c</sub>. This highlights the importance of nutritional strategies to control dysglycaemia that focus on lowering VAT, TG and LDL-C.

**Key words** Body composition, visceral adiposity, fasting plasma glucose, type 2 diabetes, Chinese

## **Diet quality, overweight and quality of life in women with advanced breast cancer**

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### **Background and Objectives:**

Transition from curative to palliative treatment is commonly seen in advanced cancer to maintain the highest possible of quality of life (QoL). Evidences highlighted that greater body fatness has been associated with poorer treatment response. Despite the changes in eating habits upon cancer diagnosis, information on level of adherence to healthy eating guidelines and its possible influence on health outcomes are lacking. This study aims to evaluate the diet quality, weight status and QoL in advanced breast cancer patients receiving treatment.

### **Methods and Study Design**

This was a cross sectional study conducted at National Cancer Institute, Malaysia. A total of 103 breast cancer patients diagnosed with stage III and IV were recruited from oncology wards and day care centre. Diet quality and health-related quality of life (HRQoL) were assessed using Healthy Eating Index (HEI)-2015 and European Organisation for Research and Treatment of Cancer-Quality of Life-Core 30 (EORTC-QLQ-C30), respectively. Weight status was categorised using body mass index (BMI). Analysis of variance (ANOVA) and multivariate analyses were performed to determine the relationship of diet quality with BMI and HRQoL.

### **Results**

The mean score of HEI-2015 was  $63.15 \pm 0.85$ . Fewer participants adhered to the recommendations of dairy (1%), refined grains (1.9%), fatty acids (5.8%), and whole grains (13.6%). Patients with higher HEI score reported significant lower BMI ( $p=0.017$ ) and poorer social functioning ( $p=0.011$ ). Duration of diagnosis, comorbidity, and radiotherapy significantly associated with HEI score. In adjusted multivariate analysis, negative association was found between HEI score and BMI ( $p=0.029$ ), while no significant association was shown for five functioning scales.

### **Conclusions:**

The overall diet quality of breast cancer patients is average. Patients with higher diet quality are likely to maintain a healthy weight. An evidence-based nutrition interventions should be provided to improve diet quality and nutritional status of this population.

**Key words** Breast cancer, diet quality, body mass index, quality of life, advanced stage

# Image-based Meal Rating System for Nutritional Assessment and Counselling: An Exploratory Study in Vietnamese Common Foods

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**Background:** The Image-based Meal Rating System (IMRS) provides individuals with a convenient and intuitive way to assess the nutritional value of their meals, promote healthier eating habits, and make informed dietary choices. Our developed system, known as IMRS, utilizes visual analysis to evaluate the healthfulness of a meal and assigns it a rating on a five-colored star scale.

**Methods:** IMRS is based on the "Healthy Eating Plate" model and considers visual characteristics like portion size, color, variety, and composition. It comprises seven components, prioritizing whole grains, protein, and vegetables while discouraging excessive portions, unhealthy fats, sugar, and sodium. Each criterion has a maximum score of 1 point, and the final score is the sum of individual scores. The score is converted to a 70-point scale by multiplying it by 10, corresponding to a rating of 1 to 5 stars. Validity was assessed by comparing it to the nutrient-rich food index (NRF) score of 6.3. Data for validation was obtained from a published database of images and nutritional composition information for common Vietnamese foods.

**Results:** In total, 398 popular Vietnamese meals were evaluated, the mean  $\pm$  standard deviation IMRS score was  $33.9 \pm 13.1$  points, with the mean star was  $2.6 \pm 0.9$  stars. Salad (45.0 points; 3.6 stars), daily rice (39.2; 2.9), porridge, and soup (38.3; 2.8) were visually evaluated as the healthiest food, whereas confection (10.0; 1.0), baked cake (17.8; 1.5), and dessert soup (19.0; 1.7) emerged as the less healthy food. Pearson's correlation coefficient between the NRF 6.3 and IMRS was  $r=0.246$  ( $p<0.001$ ).

**Conclusions:** The newly developed image-based meal scoring system shows promise in improving the visual and practical aspects of nutritional assessment and counseling. Further research is needed to integrate this model with artificial intelligence technologies for more effective and user-friendly systems. This advancement has the potential to greatly enhance nutrition management.

**Key words** imaged-based scoring system; food record; dietary assessment; nutrition counseling; Vietnam

# Relationship between social support, sarcopenia, and cognitive impairment in Chinese community-dwelling older adults

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**Background:** Cognitive impairment and sarcopenia have become important challenges for the growing ageing population. Social support is protective against cognitive impairment, but its impact on sarcopenia remains unknown. The purpose of this study was to explore the correlation between social support, sarcopenia, and cognitive impairment in Chinese older adults.

**Method:** A multi-stage whole group sampling method was used to conduct a cross-sectional survey of 720 community-dwelling older people in Shanghai. The definition of sarcopenia was in accordance with the criteria of the Asian Working Group for Sarcopenia (AWGS) 2019. Cognitive impairment was evaluated with a computerized neuropsychological assessment device that has been previously validated. Social support was assessed using the Social Support Rate Scale. Logistic regression and mediation analyses fully adjusted for all potential confounding factors were conducted.

**Results:** We found that cognitive impairment was associated with sarcopenia (OR:1.668, 95%CI: 1.064, 2.617, p: 0.026) after adjusting for confounding factors. Besides, we found that older adults with highest tertile of social support score had lowest risk of cognitive impairment (OR Tertile 3vs1:0.590, 95%CI: 0.391, 0.889, p: 0.012) and sarcopenia (OR Tertile 3vs1:0.533, 95%CI: 0.290, 0.979, p: 0.043), respectively. Furthermore, sarcopenia mediated the association of social support with cognitive impairment (indirect effect=-0.004).

**Conclusion:** Our results suggest that social support was negatively associated with sarcopenia and cognitive impairment. And sarcopenia mediated the association between social support and cognitive impairment. This study provides strong evidence for a health promotion policy of social networks against sarcopenia and cognitive impairment in Chinese community-dwelling older adults.

**Key words** social support; sarcopenia; cognitive impairment; Chinese community-dwelling older adults

## 使用合生元补充剂治疗伴有 NAFLD 的肝脏脂肪变性：随机对照试验的荟萃分析研究的系统评价

# Using Synbiotics Supplementation to Treat Hepatic Steatosis with NAFLD: A Systematic Review with Meta-Analysis Study of Randomized Controlled Trials

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**Background and objectives:** Non-alcoholic fatty liver disease (NAFLD) is a chronic liver disease that occurs in a quarter of the global adult population. Thus far, NAFLD treatments are limited to lifestyle change and medicines with considerable adverse effects, with other novel treatment of choice, such as gut microbiota supplementation are currently being researched. This meta-analysis compares the effectiveness of prebiotics, probiotics, synbiotics, and placebo treatments for NAFLD-hepatic steatosis and has been written following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses. **Methods:** This systematic review has been registered to the PROSPERO database (CRD42023392048). Assessment of the bias risk of the included studies used Cochrane Risk of Bias Tool 2. The literature search was conducted by 5 independent researchers from November 15<sup>th</sup> – December 20<sup>th</sup> 2022. **Results:** Twenty studies, limited to English language publications, have been included in the qualitative synthesis, with nineteen of those also included in the quantitative synthesis using RevMan 5.4. The outcomes of interest are Liver Stiffness Measurement (LSM), serum Alanine transaminase (ALT), aspartate transaminase (AST), homeostatic model assessment for insulin resistance (HOMA-IR), and intrahepatic triglyceride (IHTG). Out of the five outcomes of interest, AST, ALT, and IHTG demonstrate statistically significant results, supporting the use of synbiotic supplements rather than the placebo treatment, but LSM and HOMA-IR producing statistically insignificant results. To directly assess the number of lipids in patients with fatty liver disease, the parameter IHTG has been considered, which was observed in three included studies. Using synbiotics or probiotics significantly reduces IHTG with moderate heterogeneity ( $p=0.02$ ;  $I^2=60\%$ ). This study has offered a thorough and updated meta-analysis concerning the effects of synbiotic supplementation on patients with fatty liver disease. **Conclusions:** Synbiotic supplements may serve as an alternative treatment for hepatic steatosis patients with NAFLD due to its significant benefit in reducing AST, ALT, and IHTG.

**Key words** NAFLD, Probiotics, Synbiotics, Hepatic Steatosis, Gut Microbiota



## 精神益生菌对抑郁症患者疗效的评估：随机对照试验的综合系统评价和荟萃分析

### Assessment of psychobiotics efficacy on patients with depressive disorder: A comprehensive systematic review and meta-analysis of randomized controlled trials

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**Background and objectives:** Depressive disorder is a highly prevalent psychiatric condition that can lead to Major Depressive Disorder (MDD), a key contributor to disability globally. During the COVID-19 pandemic, there was a surge in the number of cases due to social problems, financial instability as well as psychological stress. Several studies also reported that MDD and other psychiatric diseases correlate with gut microbiota in a concept known as the gut-brain axis. Therefore, this study aims to assess the efficacy of psychobiotics in patients with MDD. **Methods:** A systematic literature review was conducted based on six databases and has been registered to the PROSPERO database (CRD42022348953). Mean changes from the baseline of the depression rating scale served as the primary outcome, while the adverse effect was used as the secondary

outcome. **Results:** This systematic review included 16 clinical trials of which 8 studies underwent quantitative meta-analysis. Compared to the control group, psychobiotics yielded favorable results [SMD = -0.54 (-1.01 to -0.08), although the studies were heterogenous ( $I^2 = 80\%$ ). Interestingly, the pooled results showed that psychobiotic can significantly alleviate depression and low mood compared to placebo with  $P=0.003$ . Minor treatment-related adverse effects were observed in some studies. This study revealed that psychobiotics have beneficial effects on depression status through the mechanism of reducing proinflammatory cytokines and improving the condition of microbiota dysbiosis in the gut. Furthermore, psychobiotics can serve as a potential therapy for depressive disorder or other psychiatric conditions. This review revealed that they also have a more significant benefit on depressive disorder compared to placebo. **Conclusions:** Psychobiotics can serve as a potential adjuvant anti-depressive drug due to their beneficial effects compared to placebo. These findings are expected to serve as a guide for future studies and during therapy selection.

**Key words** Depression, Psychobiotics, Probiotics, Psychiatric, Gut Microbiota

## 評估外科重症加護病房患者的早期與延遲（傳統）腸內餵養對營養狀況的影響

### Evaluating early versus late (traditional) enteral feeding on nutritional status in a surgical intensive care unit patients (SICU)

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**Background:** Most studies define early enteral nutrition (EEN) as starting within 48 hours of the initial injury or Intensive Care Unit (ICU) admission. However, adhering to guideline recommendations is challenging when providing EEN to some patients, such as those with abdominal trauma. EEN may be reluctant to be offered to these patients due to concerns about feeding-related complications.

**Objectives:** This study is intended to analyze the efficacy and safety of early enteral nutrition retrospectively (EEN; within 48 hours) versus late enteral nutrition (LEN; after 48 hours) in surgical intensive care unit (SICU) patients. The LEN group was used as the control group.

**Methods and Study Design:** This single-center, retrospective, observational study compared the clinical effects of EEN versus LEN in SICU patients. Cases in the SICU from June 2019 to November 2019 were retrospectively analyzed. Patients who received enteral nutrition therapy (ENT) for more than 7 days in the SICU and were older than 18 years were included in the study. Exclusion criteria included patients receiving total parenteral nutrition (TPN) and patients receiving palliative care (palliative care).

**Results:** 82 surgery ICU patients were enrolled. There were 41 patients in each group (EEN and LEN groups). EEN group led to a significant improvement in actual calorie and protein supply ( $p < 0.0001$ ), intensive care unit length of stay ( $p = 0.047$ ), and hospital length of stay ( $p = 0.028$ ). The LEN group had significantly lower albumin ( $p < 0.05$ ), hemoglobin ( $p < 0.05$ ), Lymphocyte ( $p < 0.05$ ), and more body weight loss ( $p < 0.05$ ). However, no significant difference was observed in the mortality rate.

**Conclusion:** Nutritional status among SICU patients in the EEN group improved. Relative to the LEN control group, the EEN group demonstrated improved length of stay and actual calorie and protein intake at discharge. EEN should be considered for these severely ill patients.

**Key words** early enteral nutrition, late enteral nutrition, intensive care unit, enteral nutrition therapy, nutritional

## Effect of milk supplemented with mulberry leaf extract, lipids and fiber on glycemic and insulin responses to a high-carbohydrate meal

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**Background:** Impaired glucose tolerance and diabetes prevalence are increasing dramatically in China. High postprandial glycemia, mainly induced by carbohydrate-rich diet, is associated with development of type-2 diabetes. The aim of this study was to test the effect of milk supplemented with mulberry leaf extract, lipids and soluble fiber on postprandial glucose and insulin following a high-carbohydrate meal in Chinese non-diabetics.

**Study design:** 31 non-diabetic Chinese adults (glycated hemoglobin A1c <6.5%) were recruited for an acute, open-label, randomized, 2-arm, cross-over controlled trial testing a standardized high-carbohydrate (65g per serving) mixed-meal breakfast with Nestlé YIYANG TangLv milk powder containing mulberry leaf extract with 1% (m/m) 1-deoxynojirimycin, lipids and soluble fiber or generic skimmed milk powder (control). Both meals with test products were carbohydrate- and protein-matched. Blood samples were taken at -5, 15, 30, 45, 60, 90, 120, 150 and 180min relative to meal intake and analyzed for glucose and insulin to calculate incremental area under the curve (iAUC) at 60, 120 and 180min.

**Results:** A per-protocol analysis was performed on 28 subjects (mean±standard deviation, age: 59.4±7.3 years; glycated hemoglobin A1c: 5.5±0.4%, body mass index: 24.4±1.6kg/m<sup>2</sup>). At 180min, glucose iAUC was not changed vs. control (202.6±94.6 vs. 221.2±119.0 mM\*min; p=0.273), but there was a trend for decreased insulin iAUC (7115±3012 vs. 8046±3014 μIU/mL\*min; p=0.087). At 120min, glucose and insulin iAUC were decreased by 14% and 17%, respectively; with a trend for the former (glucose: 141.0±68.9 vs. 163.5±88.3 mM\*min; p=0.073; insulin: 5090±2287 vs. 6155±2470 μIU/mL\*min; p=0.018). At 60min, glucose and insulin iAUC were reduced by 24% and 23%, respectively (glucose: 50.1±19.3 vs. 65.8±35.1 mM\*min; p=0.004; insulin: 1874±808 vs. 2425±1181 μIU/mL\*min; p=0.006).

**Conclusion:** Glucose and insulin responses to a high-carbohydrate meal are reduced with milk powder supplemented with mulberry leaf extract, lipids and fiber, particularly at 60 and 120min after intake, but not significantly at 180min.

**Key words** milk, mulberry leaf extract, postprandial glucose, insulin

Category: Clinical Nutrition

# **All-trans retinoic acid alleviate rheumatoid arthritis by affecting Th1-Th2 and Th17-Treg cell balance and synovial angiogenesis**

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**Background and objectives:** The clinical treatment effect for many rheumatoid arthritis (RA) patients is not ideal, and the toxic side effects of drugs for RA are hard to overcome. It is important to explore new effective measures against RA. The aim of this study was to evaluate whether all-trans retinoic acid (ATRA) can reverse the Th1/Th2 and Th17/Treg imbalance in collagen-induced arthritis (CIA) rats and whether ATRA exerts antiangiogenic effects by inhibiting matrix metalloproteinases (MMPs) and vascular endothelial growth factor (VEGF).

**Methods:** Collagen-induced arthritis (CIA) rats were treated with 0.50mg/kg • b.w. ATRA or corn oil vehicle by gavage 3 times a week for 6 weeks. The arthritis index (AI) score was assessed once a week. The levels of serum cytokines and MMPs were tested by ELISA. The Th1, Th2, Th17 and Treg cells were detected by flow cytometry (FCM). The mRNA expression of T-bet, GATA3, ROR $\gamma$ t and Foxp3 in spleens of rats were analyzed by real-time fluorescence quantitative PCR (qPCR). The qPCR and western blot (WB) assay were used to test the mRNA expression and protein expression of MMP2, MMP9 and VEGF in the synovium of rats. The microvascular density (MVD) of synovium was tested by immunohistochemical staining (IHC).

**Results:** Our results showed that ATRA induced CD4<sup>+</sup> T cell differentiation by regulating T-bet and Foxp3, restoring the balance of Th1/Th2 and Th17/Treg cells, thus the expression of the proinflammatory cytokines TNF- $\alpha$ , IL-6, and IL-2 was inhibited, and the expression of the anti-inflammatory cytokines IL-4 and IL-10 was promoted, which further alleviated inflammation. In addition, ATRA may inhibit angiogenesis by downregulating MMP2 expression, and further reduce damage to articular cartilage and bone.

**Conclusions:** The present research revealed a novel mechanism by which ATRA reduces inflammation in joints, providing new evidence for the mechanism of ATRA in the treatment of RA.

**Key words** Rheumatoid arthritis, All-trans retinoic acid, T lymphocytes, Angiogenesis, Rat

## **Encapsulated- Cow Bone Marrow Consumption Improves Brain Development and Spatial Memory Learning in Sprague Dawley Rats Offspring**

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**Background and Objectives** The rate of fetal brain development accelerates during the second half of pregnancy and remains high throughout the first year of life. Omega-3 fatty acids, specifically docosahexaenoic acid (DHA), are widely acknowledged to influence fetal and neonatal neurodevelopment. Thus, adequate ingestion of foods rich in omega-3 fatty acids, such as encapsulated-cow bone marrow during pregnancy is crucial. This study purposed to investigate the impact of consumption of encapsulated-cow bone marrow on brain development and spatial memory learning in progeny rats. **Methods and Study Design** One week was spent acclimating laboratory rodents to regular light-dark cycles of 12:12 hours. The rats were then mated in a ratio of 2:1 (female to male rats) in a single cage. The presence of the vaginal plug served as a mating indicator and was recorded as day 0 of pregnancy (H0). Rat mothers were separated into four groups: P0 (regular diet, 20% casein), P1 (low protein diet, 10% casein), P2 (low protein diet with microcapsules), and P4 (low protein diet with omega-3 fatty acids). Twenty-five days old offspring were tested in a Y-arm maze in order to assess spatial memory performance. After six weeks of treatments, the offspring were dissected then brain weight was calculated. Brain sections were made using paraffin embedding and hematoxylin-eosin staining to observe hippocampus cell numbers. Afterward, the fasting blood sample was collected to ascertain serum brain-derived neurotrophic factor (BDNF). **Results** Compared to progeny rats receiving a diet containing encapsulated-cow bone marrow and omega-3 fatty acids, animals with reduced protein diets performed poorly on the Y- arm maze test of spatial memory, brain weight, and hippocampus cell number. **Conclusion** The results imply that encapsulated-cow bone marrow rich in omega-3 fatty acids may improve brain development and spatial memory learning in rats fed a low-protein diet.

**Key words** Brain-derived neurotrophic factor, Encapsulated- cow bone marrow, Hippocampus cell number. Omega-3 fatty acid, Spatial memory learning

Category: Clinical Nutrition

## 血磷水平与成年住院患者住院时间的关系研究：基于真实世界数据的横断面研究

### The association between serum phosphate and length of hospital stay (LOS) in adult hospitalized patients: a cross-sectional study based on real-world data

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**objectives:** To investigate the association between serum phosphate and main clinical outcomes such as LOS in adult hospitalized patients.

**Methods:** This was a single-center, retrospective study and all the participants were recruited in Renji hospital from oct 1, 2018 to oct 31, 2022. Clinical parameters were collected from electrical medical records. Participants were categorized into 4 groups according to serum level of phosphate on admission: group 1 as reference: norm-phosphatemia ( $0.81\sim 1.61\text{mmol/L}$ ), group 2: mild hypophosphatemia ( $0.6\sim 0.81\text{mmol/L}$ ), group3: moderate-to-severe hypophosphatemia ( $<0.6\text{mmol/L}$ ) and group 4: hyperphosphatemia ( $\geq 1.61\text{mmol/L}$ ). Multivariate linear regression model was employed to analyze the association between different phosphate levels and LOS. Besides, the restricted cubic spline (RCS) model was additionally utilized to check the dose-response relationships between serum phosphate and clinical outcomes.

**results:** A total number of 22,157 (13,436 men and 8,721 women, aged  $57.3\pm 16.2$  y) hospitalized patients were recruited, among whom the median of serum phosphate was  $1.14\text{ mmol/L}$  (quartile range:  $1.01\text{ mmol/L}$ ,  $1.27\text{ mmol/L}$ ). The overall prevalence of hypophosphatemia was 4.70 % (1043/22157). RCS model displayed J-shape non-linear correlation between serum phosphate and LOS. Multivariate linear regression analysis demonstrated that both mild hypophosphatemia (B 1.04, 95% CI 0.26, 1.82,  $p<0.001$ ) and moderate-to-severe hypophosphatemia (B 4.94, 95% CI 3.86, 6.03,  $p<0.001$ ) were related to the prolonged LOS even after further adjustments of potential confounders compared with norm-phosphatemia, but hyperphosphatemia group lost such correlation. Per SD decrease in serum phosphate ( $=0.28\text{mmol/L}$ ) was associated with 0.38 days prolonged in LOS in fully-adjusted model. The findings in the sensitivity analyses were consistent with these results.

**conclusion:** The overall prevalence of hypophosphatemia was 4.70 % . Patients with moderate-to-severe hypophosphatemia had longest LOS and per SD decrease in serum phosphate ( $=0.28\text{mmol/L}$ ) would increase 0.38 day in LOS in fully-adjusted model which emphasized the importance of early diagnosis and treatment of hypophosphatemia.

**Key words** serum phosphatemia, hypophosphatemia, length of stay, clinical outcomes

## **Association of nutrient intake with Non-Alcoholic Fatty Liver Disease: A population-based case-control study from Delhi, India.**

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**Background and Objectives:** Diet and nutrient intake is an important factors in the development and management of non-alcoholic fatty liver disease (NAFLD); however, optimal dietary and nutrient recommendations remain unclear. Data on nutrient intakes of community-based NAFLD patients in India is scarce.

**Methods:** A community-based case-control study was conducted amongst 134 cases and 134 age and gender-matched controls aged 30–60 years residing in Delhi-NCR. Participants with grade II and III fatty liver, based on USG grading were enrolled as cases while participants with normal liver were enrolled as controls. Dietary assessments were done using 3 days 24-hour diet recall and food frequency method.

**Results:** The median intake of cereals, pulses, milk and products, sugars, and miscellaneous food items which included ready-to-eat snacks, pickles, and sauces were significantly higher in cases than controls. Frequent consumption of GLVs and fruits was observed in 80% and 50% of cases and controls respectively. The daily consumption of other seasonal vegetables, milk, and milk products was reported in nearly 60% of cases and controls. The consumption of whole grains was low amongst both groups. The median intake of energy, carbohydrates, proteins, and fats was significantly higher amongst cases. Intake of micronutrients like thiamine, niacin, total folates, calcium, iron, and zinc was adequate amongst cases compared to the controls ( $p < 0.05$ ). The micronutrient intake of cases was better than controls. Fat, protein, and carbohydrate intake was significantly and positively correlated with NAFLD ( $p < 0.05$ ).

**Conclusion:** The overall nutrient intake in NAFLD cases was significantly higher than controls. The macronutrient intakes were significantly associated with NAFLD as tested by point bi-serial correlation ( $p < 0.05$ ). Associations between select macro and micronutrients and liver health markers warrant further investigation.

**Key words** NAFLD, NUTRITION, METABOLIC DISEASE, NUTRIENT, CASES, CONTROLS

Category: Clinical Nutrition

# **Anti-inflammatory, antioxidant, metabolic and gut microbiota modulation activities of probiotic in cardiac remodeling condition: Evidence from systematic study and meta-analysis of randomized controlled trials**

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**Background and aims:** Heart Failure (HF) is a global pandemic with increasing prevalence and mortality rates annually. Its main cause is myocardial infarction (MI), followed by rapid cardiac remodeling. Several clinical studies have shown that probiotics can improve the quality of life and reduce cardiovascular risk factors. This systematic review and meta-analysis aimed to investigate the effectiveness of probiotics in preventing HF caused by a MI according to a prospectively registered protocol (PROSPERO:CRD42023388870). **Methods:** Our main search for this review was randomized controlled trials (RCTs) or clinical trials that examined the impact of probiotics supplementation on reducing cardiac remodeling in the condition of HF or high risk for developing HF such as post-MI. We searched Embase, PubMed, the Cochrane Library, Wiley, and ProQuest before January 2nd, 2023. **Results:** Four independent evaluators independently extracted the data using predefined extraction forms and



evaluated the eligibility and accuracy of the studies. A total of six studies consisting of 366 participants were included in the systematic review. Probiotics are not significant in intervening left ventricular ejection fraction (LVEF) and high sensitivity C-reactive protein (hs-CRP) when compared between the intervention group and the control group due to inadequate studies supporting its efficacy. Among sarcopenia indexes, hand grip strength (HGS) showed robust correlations with the Wnt biomarkers ( $p < 0.05$ ), improved short physical performance battery (SPPB) scores were also strongly correlated with Dickkopf-related protein (Dkk)-3, followed by Dkk-1, and sterol regulatory element-binding protein 1 (SREBP-1) ( $p < 0.05$ ). The probiotic group showed improvement in total cholesterol ( $p = 0.01$ ) and uric acid ( $p = 0.014$ ) compared to the baseline. Conclusion: Finally, probiotic supplements may be an anti-inflammatory, antioxidant, metabolic, and intestinal microbiota modulator in cardiac remodeling conditions. Probiotics have great potential to attenuate cardiac remodeling in HF or post-MI patients while also enhancing the Wnt signaling pathway which can improve sarcopenia under such conditions.

**Key words** Cardiac remodeling, probiotic, health failure, myocardial Infarction, gut microbiota modulation

Category: Clinical Nutrition

# 住院肝硬化患者人体测量学指标及营养状态分析

## Anthropometry indicators and nutritional status analysis of hospitalized patients with liver cirrhosis

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**Objectives:** To analyze the anthropometric indexes and nutritional status of hospitalized patients with cirrhosis, in order to discover the nutritional risk or malnutrition of patients. **Methods:** A total of 164 patients with cirrhosis admitted to a Grade-3 A general hospital in Zunyi City from May 2022 to March 2023 were selected for nutritional risk screening using nutritional risk screening 2002 (NRS2002), and divided into nutritional risk group and non-nutritional risk group. Upper arm circumference (AC), upper arm muscle circumference (AMC), triceps cutaneous fold thickness (TSF) and grip strength (GS) were measured in the two groups. Body mass index (BMI) was calculated, and total protein, albumin and other related indexes were collected. Statistical analysis was performed on the two groups. **Results:** Among the 164 patients with cirrhosis, there were 124 males (75.61%) and 40 females (24.39%), with an average age of  $(51.02 \pm 9.33)$  years, and 60 patients (36.58%) with nutritional risk, including 12 patients (20%) and 27 patients (45%) with grade A and Grade B. There were 21 patients (35%) at grade C, 54 patients (32.93%) at compensation stage, of which 15 patients (27.78%) were at nutritional risk, 110 patients (67.07%) at decompensation stage, of which 45 patients (40.91%) were at nutritional risk. There were statistically significant differences in BMI, AC, AMC, GS, total protein, albumin and other indexes between the two groups ( $P < 0.05$ ). The AC, AMC, GS, total protein, albumin and prealbumin in patients with cirrhosis with nutritional risk were significantly lower than those without nutritional risk, with statistical significance ( $P < 0.05$ ). **Conclusions:** The incidence of nutritional risk in hospitalized patients with cirrhosis is high. Nutritional intervention should be performed as soon as possible to promote the prognosis of patients and improve their quality of life.

**Key words** cirrhosis; Anthropometry; Nutritional risks; Screening

## **A study on the correlation between TyG level in early pregnancy and adverse pregnancy outcomes and complications**

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**Objective:** To investigate the relationship between Fasting blood glucose (FBG) and serum Triglyceride (TG) in early pregnancy and preterm birth (preterm birth). PTB), Giant baby (GB), Gestational diabetes mellitus (GDM) and Gestational hypertension.

**Methods:** A total of 553 healthy pregnant women who delivered in Shanghai Xinhua Hospital from 2016 to 2017 were selected as the study subjects. Patients were grouped according to TyG level, and the differences in the risk of pregnancy outcomes between different TyG levels were compared. Logistic regression was used to analyze the effect of TyG level in the first trimester on adverse pregnancy outcomes.

**Results:** The overall incidence rate of preterm birth was 3.4%, and the high TyG group (5.5%) was 2.04 times as high as the low TyG group (2.7%). The overall incidence of macrosomia was 9%, and the incidence of high TyG group (9.8%) was 1.67 times higher than that of low TyG group. The total prevalence of gestational hypertension was 17.5%, and the prevalence of TyG high level group (21.3%) was 1.42 times higher than that of low level group (15%). Logistic regression analysis showed that high level of TyG was not a risk factor for preterm birth, macrosomia and pregnancy-induced hypertension. The total prevalence of gestational diabetes mellitus was 22.6%. The prevalence of gestational diabetes mellitus in the high TyG group (38.8%) was 2.9 times higher than that in the low TyG group (13.4%). Logistic regression analysis showed that high level of TyG was a risk factor for gestational diabetes mellitus (OR=2.41, 95%CI:1.256-4.608, P<0.05). ROC curve showed that TyG=7.674 was the cut-off value for the diagnosis of GDM.

**Conclusions:** Elevated TyG in the first trimester is a risk factor for GDM, and a TyG value of 7.674 in the first trimester can play a role in predicting GDM.

**Key words** TyG index, preterm birth, macrosomia, gestational diabetes, gestational hypertension

## **Efficacy of Four weeks Traditional Asian Dietary Program on Gastrointestinal Symptoms, Stool Consistency and Stool Output in Healthy Volunteers**

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**Introduction:** Traditional Asian Diet (TAD) is composed of high fiber, moderate protein, healthy fat and fermented foods. However, the clinical benefits of TAD on gastrointestinal (GI) symptoms are not known. This study aimed to examine the efficacy of TAD on symptoms, stool consistency and stool output among healthy volunteers.

**Methodology:** 20 eligible women (mean age  $28.5 \pm 6.9$  yrs) were recruited in this pilot quasi-experimental study. Participants were randomized into intervention (n=10) or control group (n=10). The intervention group was prescribed the TAD program for 4 weeks which consisted of educational session using a validated instructional diet manual and weekdays lunch supplies using the designated menu. Participants in the control group were asked to maintain their habitual dietary intake. The primary outcomes were symptoms (Structured Assessment of GI Symptoms Scale or SAGIS), stool consistency (Bristol Stool Form Scale) and frequency of stool output per week. Data were tested within and between-group differences at week-0 (T0), week-2 (T1) and week-4 (T2) using the Friedman test. Data were presented in the median  $\pm$  interquartile range with  $p < 0.05$  as significant.

**Results:** For within group differences, TAD was efficacious in reducing constipation (T0=  $1.0 \pm 3.0$ ; T1=  $0.0 \pm 1.0$ ; T2=  $0.0 \pm 1.0$ ,  $p = 0.006$ ), total score of SAGIS (T0=  $3.0 \pm 12.0$ ; T1=  $2.0 \pm 5.0$ ; T2=  $1.5 \pm 5.0$ ,  $p = 0.03$ ), BSFS score (T0=  $3.0 \pm 0.0$ ; T1=  $4.0 \pm 0.0$ ; T2=  $4.0 \pm 0.0$ ,  $p = 0.001$ ) and stool output per week (T0=  $3.8 \pm 2.25$ ; T1=  $6.0 \pm 1.16$ ; T2=  $6.1 \pm 1.30$ ,  $p = 0.005$ ) but no differences were found for controls (all  $p > 0.05$ ). For between-group differences, compared to controls, TAD was effective for diarrhea predominant irritable bowel syndrome ( $p = 0.004$ ), constipation ( $p = 0.02$ ), BSFS score ( $p < 0.0001$ ) and stool output per week ( $p = 0.003$ ).

**Conclusion:** The four weeks TAD program has beneficial effects on GI symptoms, stool consistency and stool output per week. Further research including gut microbiome and metabolome is required to better understand the underlying mechanisms.

**Key words** Traditional Asian Diet, gastrointestinal symptom, stool consistency, stool output

## **Interaction of vitamin D receptor gene FokI variants and PUFA w3 on perceived stress score and serum cortisol levels in nurses: a cross-sectional study**

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**Background/objective:** There is a high prevalence of perceived stress among nurses. Recent studies have shown that PUFA w3 and genetic variants contribute to perceived stress. This study aimed to examine interactions between vitamin D receptor (VDR) gene FokI polymorphism and PUFA w3 on perceived stress score and serum cortisol levels in nurses.

**Materials and methods:** A total of 268 Iranian nurses (248 women; 20 men) participated in this cross-sectional study. PUFA w3 and perceived stress score of participants were evaluated using a 3-day food record and the Perceived Stress Scale (PSS)-10, respectively. Serum cortisol concentrations were evaluated by ELISA. VDR FokI polymorphism was genotyped using the restriction fragment length polymorphism method.

**Results:** No significant relationship was found between PUFA w3 with perceived stress score or cortisol level in FF genotype carriers, but, lower intake of PUFA was related to higher cortisol level ( $p=0.04$ ) in Ff carriers. Significant interactions were observed between VDR FOKI polymorphism and intakes of eicosapentaenoic acid (EPA) (P Interaction=0.06), linoleic acid (P Interaction=0.06), and docosahexaenoic acid (DHA) (P Interaction=0.06) on serum cortisol. in this way that lower intake of EPA, linoleic acid, and DHA was associated with an increase in cortisol levels in individuals with ff genotype. Moreover, in carriers of ff genotype, lower intake of EPA was related to the elevated perceived stress score (P Interaction=0.06).

**Conclusion:** FokI polymorphism interacts with PUFA w3 (EPA, linoleic acid, and DHA) to increase cortisol level and with EPA to increase perceived stress score in nurses.

**Key words** PUFA w3; Eicosapentaenoic Acid, Docosahexaenoic Acids, Linoleic Acid, Vitamin D receptor; Receptors Calcitriol , Interaction

# **Serum amino acid profiles as potential biomarkers for insulin resistance in Korean individuals with and without diabetes**

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**Background and objectives:** Insulin resistance, which is common in individuals with type 2 diabetes mellitus (T2DM), can lead to increased proteolysis and decreased protein synthesis. Recently, the association of serum amino acid profile and diabetes has been reported. However, few studies have been reported in Korean populations, about the usefulness of serum amino acids for evaluating disease risks. The purpose of this study was to investigate the difference in serum amino acids related to insulin resistance in Korean adults with and without diabetes.

**Methods:** In this study, we recruited 57 Korean adults and analyzed the fasting serum levels of amino acids to compare the differences between normal control group and diabetes group. A total of 19 serum amino acids were measured using a high-performance liquid chromatography with fluorescence detection. Anthropometrics and body composition were measured using bioelectrical impedance analysis.

**Results:** There were 6 amino acids, which were significantly different in two groups ( $p < 0.05$ ). Significantly decreased levels of glycine, serine and significantly increased levels of glutamine, methionine, proline, cystine in diabetics were found. But there was no significant difference in the levels of serum branched-chain amino acids, aromatic amino acids, and other amino acids between the two groups.

**Conclusions:** Our study revealed a significant difference in the metabolism of amino acids between individuals with diabetes and those without the condition. The changed amino acid levels detected in patients with diabetes may be indicative of the disease, and hence can potentially serve as a useful biomarker for diabetes diagnosis and prognosis.

**Key words** Amino acids, Diabetes mellitus, Insulin resistance

# **EPA 是脂类营养防控心血管事件的最佳干预方案**

## **EPA is the optimal lipid treatment in preventing against the major cardiovascular events: a network meta-analysis of randomized controlled trials**

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**Background & Objectives:** The role of omega-3 polyunsaturated fatty acids (PUFAs) in primary and secondary prevention on major cardiovascular events (MCE) is inconclusive due to the potential heterogeneity in study designs of formulas, dosages, and ratios of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) from the findings of previous randomized controlled trials (RCTs).

**Methods & Study Design:** We conducted a comprehensive narrative review of pre-clinical studies and updated a network meta-analysis (NMA) to determine the comparative efficacy against MCE with different EPA/DHA dosages and formulas. Supplements of omega-3 PUFAs were divided into  $< 2$ -g/day and  $\geq 2$ -g/day groups, and each supplement was subdivided into high-ratio ( $>1$ ) and low-ratio ( $\leq 1$ ) groups. Primary outcomes were the efficacy against the risk of a composite MCEs involving cardiac death, hospitalization due to a cardiac event, myocardial infarction, and/or cardiac arrest, presented as hazard ratios (HRs) with 95% confidence intervals (CIs).

**Results:** We found that pure EPA was ranked the best option in the secondary coronary prevention (HR: 0.72, 95% CI: 0.65 to 0.81) from the NMA of 39 RCTs with 88,359 participants, with more cardioprotective benefits than mixture formulations (HR for comparisons with  $< 2$ -g/d mixture with a high EPA/DHA ratio: 0.76, 95% CIs: 0.66 to 0.87; HR for comparisons with  $\geq 2$ -g/d mixture with a low EPA/DHA ratio: 0.82, 95% CIs: 0.71 to 0.94). There was no evidence of omega-3 PUFAs' efficacy in primary prevention. The mechanisms of omega-3 PUFAs' cardiovascular protection might link to the effects of anti-inflammation and stabilization of endothelial function from PUFA' s derivatives including eicosanoids and the special pre-resolving mediators (SPMs).

**Conclusions:** EPA is the best lipid agent in secondary coronary prevention, which may provide the insights into optimal uses of omega-3 PUFAs in treatment guidelines.

**Key words** EPA, Omega-3, Network meta-analysis, Cardiovascular disease, Major cardiovascular events

## Assessment of linear growth faltering among severe acute malnourished (SAM) and non-SAM children: efficacy of fecal pH as a bedside tool

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**Background and objectives:** Chronic malnutrition, often manifested as linear growth failure or stunting, is the commonest form of malnutrition across the globe. Studies show, gut microbiota of stunted children are predominant in bacteria belonging to inflammogenic taxa including *Desulfovibrio* genus and *Campylobacterales* order. On contrary, gut microbiota of children with optimum linear growth is enriched in probiotic species, especially *Bifidobacterium* and commensal *Clostridium clusters XIVa and IV*. These species release short-chain fatty acid that in turn lowers the pH in the colon and contributes in stool acidification, reducing pH of stool. Assessment of fecal pH, a low cost non-invasive method, is strongly driven by abundance of these species in the gut, leading to assumption of a probable indirect inverse relationship between fecal pH and linear growth. In this study, we aimed to explore the association of fecal pH with linear growth among 6–24 months old ill, non-SAM children hospitalized for non-gastrointestinal morbidities.

**Methods:** This cross-sectional study was conducted on 100 non-SAM children aged between 06–24 months getting admitted in Dhaka Shishu Hospital for non-gastrointestinal pathologies. Anthropometric, socio-demographic and food frequency questionnaire data was recorded and 5g of stool sample was collected for assessing fecal pH using a pH meter.

**Results:** 43% of children were hospitalized for fever and 31% for pneumonia. The mean LAZ and fecal pH of the children were  $-0.99 \pm 1.07$  and  $5.95 \pm 0.76$ , respectively. Pearson correlation showed a statistically significant negative correlation between stool pH and LAZ scores ( $p < 0.05$ ). After inclusion of other factors affecting linear growth into the regression model, a statistically significant inverse association was observed between fecal pH and LAZ score ( $p < 0.01$ ).

**Conclusions:** Elevated fecal pH was found to have a significant association with stunted growth. Fecal pH might have emerged as a possible indirect indicator of gut microbiota status, hence a determinant of childhood stunting.

**Key words** Fecal pH; stunting; hospitalized; children; Bangladesh



## Prevalence and risk factors of malnutrition according to GLIM criteria in patients with hepatocellular carcinoma: a single-center cross-sectional study

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**Aim:** Malnutrition is highly prevalent in hepatocellular carcinoma (HCC) patients and is associated with a poor prognosis, making early identification and management crucial for improving outcomes. This study investigated malnutrition in HCC patients and evaluated the efficacy of the Nutrition Risk Screening 2002 (NRS2002) and the scored Patient-Generated Subjective Global Assessment (PG-SGA) compared to the Global Leadership Initiative on Malnutrition (GLIM) Criteria. The study also identifies independent risk factors associated with malnutrition in HCC patients.

**Methods:** A cross-sectional study was conducted on 207 HCC patients. Nutritional screening/assessment results and blood samples were gathered within 72 hours of admission. The performance of the screening tools was evaluated using Kappa (K) values. Logistic regression analyses were performed to determine if clinical parameters, such as serum albumin (ALB), hemoglobin (HGB), lymphocyte (LYM) count, ascites (ASC), portal hypertension (PHT), tumor diameter, tumor number, Child-Pugh class, Barcelona Clinic Liver Cancer Stage (BCLC), and Model for albumin-bilirubin (ALBI) scores, were associated with malnutrition as identified by the GLIM criteria.

### Results:

Results: 30.4% of participants were at risk of malnutrition according to NRS2002. The agreement between NRS2002 and GLIM criteria was substantial (K-value: 0.626,  $P < 0.01$ ), with low sensitivity (65.9%) and high specificity (94.3%) for NRS2002. GLIM criteria and PG-SGA diagnosed malnutrition in 41.1% and 54.6% of participants, respectively (K-value: 0.658,  $P < 0.01$ ). PG-SGA had high sensitivity (95.3%) but low specificity (73.8%) for identifying malnutrition according to GLIM criteria. The GLIM criteria accurately detected malnutrition (75.2% accuracy) and non-malnutrition (95.7% accuracy) in the light of PG-SGA. Age, Child-Pugh score, anemia, and ASC were significantly associated with malnutrition in multivariate logistic regression (Hosmer and Lemeshow goodness of fit  $\chi^2 = 9.227$ ,  $P = 0.324$ ).

**Conclusion:** GLIM criteria can be a valuable tool for diagnosing malnutrition in HCC patients, with NRS 2002 and PG-SGA as complementary options, while understanding the

**Key words** hepatocellular carcinoma, malnutrition, nutrition assessment, diagnostic criteria, Global Leadership Initiative on Malnutrition

Category: Clinical Nutrition

# 植物蛋白在一例慢性肾脏病合并肌肉减少症患者中的应用：一例 临床营养病例报告

## Application of Plant Protein in a Patient with Chronic Kidney Disease and Sarcopenia: A Case Report in Clinical Nutrition

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**Background and Objectives:** Chronic Kidney Disease (CKD) has become a major public health problem, an irreversible and progressive condition that has emerged as one of the leading causes of death worldwide. Implementing Nutritional therapy plays an important role in preventing the progression of CKD, while also helping to reduce mortality rate and improved quality of life. Nowadays, in the nutritional therapy of patients with CKD, more and more experts are paying attention to plant-based proteins.

**Case/Intervention:** A 40-year-old man with end-stage of chronic kidney disease accompanied by Sarcopenia. He was admitted and treated with integrated treatment for chronic renal failure and underwent peritoneal dialysis. The results of Nutritional Risk Screening 2002 and Subjective Global Assessment showed that the patient is at high nutritional risk and diagnosed with severe malnutrition. Nutritional therapy was then administered for almost one month. He received total enteral nutrition containing a protein composition based on plant proteins while in the hospital and significantly improved body conditions and laboratory results. His whole body phase angle increased, phosphorus level, total protein and Albumin upgraded to the normal range followed by pre albumin which showed a significant increase from 79.2 mg/L to 141.3 mg/L and his infection was significantly controlled. In addition, he showed increased muscle strength as the grip strength of both hands improved and had more strength in mobility.

**Conclusion:** CKD is one of the most common chronic diseases worldwide, which is progressive, fatal and lethal. The results of this study demonstrated that the protective role of plant-based protein in kidney disease. This may provide new evidence for physicians and healthcare providers in the treatment and prevention of CKD.

**Key words** Severe Malnutrition, Chronic Kidney Disease, Sarcopenia, Clinical Nutrition, Plant Protein

## What is the best way to take oral iron supplements?

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**Background:** Guidelines to treat iron deficiency recommend daily 100mg oral iron in the morning away from meals and with ascorbic acid (AA). Our objectives were to 1) compare the effects of consecutive-day versus alternate-day oral iron supplementation on serum ferritin (SF) and gastrointestinal side effects; 2) assess the effects of dietary inhibitors and enhancers, and time of day, on fractional iron absorption (FIA) from oral iron supplements.

**Methods:** In a randomized double-blind placebo-controlled study, iron-deficient women received either daily 100mg iron for 90d, followed by daily placebo for 90d (consecutive-day-group) or 100mg iron and placebo on alternate days for 180d (alternate-day-group). We collected blood/stool samples every six weeks, and we assessed side effects using a mobile application. In a crossover study, fasting iron-deficient women received labeled Fe [<sup>54</sup>Fe]-, [<sup>57</sup>Fe]- or [<sup>58</sup>Fe] with oral doses of 100mg iron with: 1) water (reference); 2) 80mg AA; 3) 500mg AA; 4) coffee; 5) breakfast; 6) water in the afternoon. We measured FIA as erythrocyte incorporation of iron stable isotopes 14d later.

**Results:** At equal total iron doses, comparing consecutive-day and alternate-day groups, median SF was 43.8 (31.7 – 58.2)ug/L versus 44.8 (33.8 – 53.6)ug/L ( $p=0.83$ ) and the longitudinal prevalence ratio for gastrointestinal side effects on days of iron intake was 1.56 (95%CI:1.38, 1.77;  $p<0.0001$ ). Compared to the reference: 80mg AA increased FIA by 30% ( $p=0.00034$ ), but 500mg AA did not further increase FIA ( $p=0.226$ ); coffee decreased FIA by 54% ( $p=0.0039$ ); coffee with breakfast decreased FIA by 66% ( $p<0.0001$ ). FIA was 37% lower ( $p=0.059$ ) in the afternoon than in the morning.

**Conclusions:** Compared to consecutive-day dosing, alternate-day dosing had comparable efficacy but triggered fewer gastrointestinal side effects. Compared to consuming 100mg iron in the morning with coffee or breakfast, consuming it with orange juice alone results in a ~4-fold increase in FIA, and provides ~20 more mg of absorbed iron per dose.

**Key words** iron deficiency, oral iron supplementation, dosing regimen, iron absorption

# **Inadequate energy and protein intake, underweight and malnutrition are associated with in-hospital mortality among COVID-19 rehabilitation patients during the Omicron outbreak in Hong Kong**

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## Objective

Malnourished COVID-19 patients were prone to higher mortality and longer length of stay (LOS). This study aims to investigate the malnutrition risk prevalence in the COVID-19 patients and how other nutritional indicators are related to the clinical outcomes in a rehabilitation hospital.

## Methods

A retrospective cross-sectional study involved 174 COVID-19 patients during the rehabilitation phase. Malnutrition risk, nutritional indicators, mortality, and LOS were compared among different risk groups. Albumin, nutrition intake, and body mass index (BMI) were investigated for their effects on the clinical outcomes.

## Results

The prevalence of malnutrition risk was 94.9%; those older were higher in malnutrition risk. BMI, energy and protein intakes decreased as the malnutrition risk increased. Albumin, energy and protein intakes were lower in the death group. The high malnutrition risk group and severely underweight patients had 2.7 times and 2.2 times higher in-hospital death, respectively. For subjects  $\geq 75$  years old, the odds ratio to death was 6.2 compared to those  $< 75$  years old.

## Conclusion

We observed a high malnutrition risk of 94.9% in COVID-19 patients. Patients with malnutrition risk had a lower BMI, lower nutritional intake, and a higher chance of in-hospital death. These results reinforced the importance of nutrition management in COVID-19 patients.

**Key words** Malnutrition, COVID-19, Clinical outcome

# **Association between the imbalance of maternal folate and vitamin B12 status in early pregnancy and gestational diabetes mellitus risk is affected by serum selenium status**

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**Background:** The role of B vitamins imbalance status on gestational diabetes mellitus (GDM) risk has aroused great interest, but existing studies are inconsistent. We aimed to assess whether the association between the unbalanced vitamins status and GDM risk can be affected by status of other micronutrients.

**Methods:** We measured red blood cell (RBC) folate, serum vitamin B12, D, and selenium in the first trimester of pregnancy. Association between the status of RBC folate and vitamin B12 imbalance and GDM risk were examined with logistic regression, stratified by serum selenium or vitamin D status.

**Results:** Overall, women in higher RBC folate/vitamin B12 ratios did not have a significantly higher risk of GDM than those in reference tertile (all  $P > 0.05$ ). Further, women were divided into deficient and non-deficient groups according to the serum or vitamin D levels, respectively. In women with selenium deficiency, the highest odds [OR: 3.398 (1.158–9.974),  $P=0.026$ ] of GDM were observed among women with the highest tertile of RBC folate/vitamin B12 ratio after adjustment for covariates; However, similar findings were not observed in pregnancies with normal selenium status. Regardless of vitamin D status, women with higher RBC folate/vitamin B12 ratios did not show a significantly higher risk of GDM.

**Conclusion:** Micronutrient deficiency is common in early pregnancy. Women with higher folate/vitamin B12 ratio coupled with selenium deficiency in early pregnancy have a higher GDM risk. These findings reveal the importance of micronutrients detection in early pregnancy and subsequent interventions for micronutrient deficiency.

**Key words** gestational diabetes mellitus; folate; vitamin B12; early pregnancy; selenium deficiency

## Improvement in body composition and glycaemic parameters with winter melon extract supplementation among type 2 diabetic patients

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**Background and objectives:** Winter melon (*Benincasa hispida*) is a species from cucurbit family that serves as an important vegetable in many Asian countries. There is robust *in vivo* evidence of using winter melon in improving metabolic parameters in diabetes. This study evaluated the effectiveness of winter melon aqueous extract on the body compositions and glycaemic parameters of patients with type 2 diabetes.

**Methods:** Powdered drink formulated with winter melon aqueous extract was prepared as test food. Another formulation of powdered drink without winter melon extract was prepared as placebo. Fifty individuals diagnosed with type 2 diabetes from outpatient clinic Hospital Universiti Sains Malaysia were included in a randomized, single-blinded, parallel trial with a 12-week intervention. The anthropometric and biochemical variables were assessed at baseline, 6 weeks and 12 weeks after beginning of the trial.

**Results:** Fasting plasma glucose from baseline to Week 6 in winter melon group showed a greater reduction than in placebo group ( $\Delta$  -0.91 mmol/l, 95% CI: -1.89, 0.07 vs  $\Delta$  -0.60 mmol/l, 95% CI: -1.53, 0.34, respectively). Body weight increased in winter melon group ( $\Delta$  0.27 kg, 95% CI: -0.54, 1.07) but decreased in placebo group ( $\Delta$  -0.81 kg, 95% CI: -1.64, 0.03). However, body fat percentage did not change significantly within each group throughout the study ( $p > 0.05$ ). Conversely, mean lean body mass showed favourable trend of increment at Week 6 ( $\Delta$  0.05 kg, 95% CI: -0.40, 0.49) and Week 12 ( $\Delta$  0.16 kg, 95% CI: -0.33, 0.64) as compared to baseline in winter melon group but not in placebo group which manifested decreasing lean body mass.

**Conclusions:** This study suggested the potential effectiveness of winter melon extract supplementation on fasting plasma glucose and lean body mass in type 2 diabetes and is likely to be applied as an ingredient in functional food production.

**Key words** blood glucose, body fat, diabetes, lean body mass, winter melon

Category: Clinical Nutrition

## **Research progress on the role of nutrition in stroke-related sarcopenia**

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Stroke is one of the most common causes of disability in adults. Sarcopenia is a syndrome characterized by progressive systemic muscle loss and functional decline. The loss of muscle mass and decreased function throughout the body after stroke cannot be explained by brain injury alone and is considered to be a secondary sarcopenia known as stroke-associated sarcopenia. Mounting evidence shows that stroke-related sarcopenia can promote the occurrence and development of sarcopenia through various pathogenesis such as muscle atrophy, dysphagia, inflammation, and malnutrition, etc. Currently, the main indicators used to assess malnutrition in patients with stroke-related sarcopenia include temporalis muscle thickness, calf circumference, phase angle, Geriatric nutritional risk index and mini-nutritional assessment short form, etc. At present, there is no particularly effective method to curb its progression, but supplementation the body with essential amino acids, vitamin D, high energy diet, avoiding Polypharmacy, as well as increasing physical activity level and reducing sedentary lifestyle may improve the malnutrition status of stroke patients, and increase the muscle mass and skeletal muscle index of stroke related sarcopenia, further delay or even prevent the development of stroke-related sarcopenia. This article reviews the latest research progress on the characteristics, epidemiology, pathogenesis and the role of nutrition in stroke-related sarcopenia, so as to provide reference for the clinical treatment and rehabilitation of stroke-related sarcopenia.

**Key words** Stroke; Sarcopenia; malnutrition; Temporal muscle thickness; Phase Angle; Calf circumference; Geriatric nutritional risk index

# 大黄对蒙古族传统功能性食品的研究。 Study to Mongolian traditional functional food from Rheum Undulatum L.

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## Background

In ancient times, Rhubarb (*Rheum Undulatum* L.) was widely used both in traditional medicinally and non-pharmacologically, to treat poisonous fever, internal heat, diarrhea, indigestion, menstrual cramps, bloating and constipation. Therefore, by extracting and introducing food-regulated products enriched by Rhubarb for daily use, it is possible to protect gastrointestinal function, which is a source of all diseases, to prevent blood clots, vascular hardness, diabetes, the cardiovascular system disease and preventing cancer.

## Aim

Development of technology for food products with regulatory activity of *Rheum Undulatum* L., a traditional medicinal plant.

## Research objectives

1. Developing technology of filling with Rhubarb (*Rheum Undulatum* L.) rhizome stem
2. Developing technology instructions for the production of concomitant pastries prepared with Rhubarb (*Rheum Undulatum* L.) rhizome stem
3. Calculating Standard calculation coefficient (SCC) of taste and potency of traditional medicine drug and determine the characteristics, composition, physical chemistry and hygiene of the made functional food product.

## Conclusions:

1. The contents of 40 grams of brown sugar per 100 grams of *Rheum Undulatum* L. was the most suitable for the development of pastry filling technology. In 50 grams of pastry product 15 grams of fillings was determined as the optimal ingredient.

Rhubarb pastry product meet the technical quality requirements of MNS 2488:2021 standard, has a fat content of no more than 10% and no leaven in dough was developed under certified recipes and technological guidelines for the production of bakery products.

According to the standard calculation coefficient (SCC) of taste and potency of drug, the ingredients in 50g of the product have rlung suppressing SCC=0.76, mkhris pa suppressing SCC=1.1, badkan suppressing SCC=0.57, cool ability to suppress mkhris pa, heavy ability to suppress rlung, light and harsh ability to suppress badkan, phenolic compound content was 15 mg/g for those it's proven to perform regulatory actions.

**Key words** *Rheum Undulatum* L, functional food ,



Category: Clinical Nutrition

## **Nutritional Assessment of pre-dialysis Patients with Chronic Kidney Diseases using the Malnutrition Inflammation Score (MIS)**

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2.

### Background and objectives

Major causes of malnutrition is insufficient nutrition and energy intake as well as the lack of relevant nutritional knowledge. The objectives of this study are to look at the result of nutritional assessment of pre-dialysis patients with chronic kidney diseases using the Malnutrition Inflammation Score (MIS) as well as the benefits of nutritional education on these patients. The study was conducted by evaluating nutritional status of 30 pre-dialysis patients with chronic kidney diseases twice with 3 months

### Methods

Nutritional assessments were conducted using the Malnutrition Inflammation Score (MIS) .

### Results

The sample consisted of 21 male patients and 9 female patients . The first round of assessments revealed 16 patients with 'Mid' malnutrition, 12 with 'Moderate' malnutrition, and 2 with 'Severe' malnutrition. The second round of assessments, taken 3 months after the first round, showed an increase of the number of patients with 'Mid' malnutrition to 20

Assessed by individual interviews and evaluation of food consumption , are reflected by the fact that the patients were able to lower their consumption with correct proportion of nutrients appropriate for their diseases. The patients consumed an average of 0.58 grams of protein per 1 kg of body weight per day, 1,803 milligrams of sodium per day, 467 milligrams of potassium per day, and 201 milligrams of phosphorus per day.

### Conclusions

To help slow down deterioration of the kidneys, patients need to be aware of what health behaviours have direct impacts on the progression of the disease, while medical practitioners must provide educational support to promote beneficial health behaviours that help slow down deterioration of the kidneys.

**Key words** Malnutrition Inflammation Score

## 膳食补充绿藻 *Caulerpa racemosa* 的抗肥胖作用：一项针对肥胖男性的随机双盲安慰剂对照临床试验

### Antiobesity effect from the dietary supplementation of green algae *Caulerpa racemosa*: A randomized double-blind placebo-controlled clinical trial in obese men

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**Background and objectives:** More than 1 billion people worldwide are obese and the number is still increasing. Obesity leads to a range on cardiometabolic syndrome, such as type 2 diabetes, and cardiovascular-related disease. Various anti-obesity innovations continue to develop. Doses of 30 mg/200g BW Sea grapes (*Caulerpa racemosa*) extract (SGE) in a previous pre-clinical trial, showed that it ameliorates of obesity markers in rats model obesity. However, it has not represented the SGE efficacy in humans trial. Therefore, this clinical trial was aimed to support the effect of SGE on blood glucose (BG), total cholesterol (TC), fat mass and obesity-associated (FTO) protein and PGC-1 $\alpha$  levels in obese men according to a prospectively registered protocol (ClinicalTrials.gov; NCT05037591). **Methods:** The study was a 4-weeks, randomized, double-blind, placebo-controlled clinical trial. A total 70 participants (35 subjects received SGE, 35 subjects received placebo) were included in this study. Evaluation during the initial visit includes physical examination in the form of Body Mass Index (BMI) and laboratory tests blood glucose (BG), triglycerides (TG), high-density lipoprotein (HDL), low-density lipoprotein (LDL) and total cholesterol (TC), FTO protein, and PGC-1 $\alpha$  were performed on all participants within 1 week of the initial screening. SGE (1.68 g/70kg BW) were given to participants in intervention group once daily, 15 minutes before lunch, the control group received placebo. **Results:** After 4 weeks intervention, there were significant reductions ( $p < 0.05$ ) in BG, TC, LDL, TG, waist circumference, FTO protein, and body weight. There was also a significant increase in PGC-1 $\alpha$  and HDL level ( $p < 0.0001$ ). Interestingly, a pattern of decreasing BMI was observed from baseline (0-week) after 4 weeks of SGE intervention. **Conclusions:** *Caulerpa racemosa* has potential antiobesity effect, reduce the risk and help to control cardiometabolic syndrome via upregulating of PGC-1 $\alpha$  and HDL, and followed by downregulating of FTO protein in obese men.

**Key words** Obesity; Natural Product, Algae, Obese Men, Clinical Trial

# 视网膜静脉阻塞患者体内长链多不饱和脂肪酸氧化的代谢组学分析

## Metabolomic profiling of long-chain polyunsaturated fatty acid oxidation in patients with retinal vein occlusion

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**Objective:** Long-chain polyunsaturated fatty acids (LCPUFA) and their metabolites are closely related to neovascular eye diseases. However, the clinical significance of their oxidative metabolites in retinal pathologies remains inconclusive. This cross-sectional study aimed to explore metabolomic profiles of LCPUFA oxidation in retinal vein occlusion (RVO) patients, and to identify potential indicators for diagnosis and prediction of the disease progression.

**Methods and Study Design:** Venous blood samples were collected from 44 RVO patients and 36 normal controls. The plasma levels of  $\omega$ -3 and  $\omega$ -6 LCPUFA and their oxylipins were analyzed using ultra-performance liquid chromatography tandem mass spectrometry. Univariate analysis combined with principal component and orthogonal projections to latent structure discriminant analysis was used to screen differential metabolites. Ex vivo aortic ring and choroidal explant sprouting assays were used to investigate the effects of 5-oxo-eicosatetraenoic acids (ETE) on angiogenesis. Tubule formation and wound healing assays were performed to verify the effects of 5-oxo-ETE on human retinal microvascular endothelial cell (HRMEC) functions.

**Results:** Higher  $\omega$ -6 and lower  $\omega$ -3 LCPUFA levels were measured in the plasma of RVO vs. control patients. Metabolomic analysis revealed 20 LCPUFA and their oxylipins dysregulated in the RVO patients, including increased arachidonic acid ( $\omega$ -6) and its lipoxygenase product 5-oxo-ETE, as well as decreased docosahexaenoic acid ( $\omega$ -3). Interestingly, the 5-oxo-ETE levels were lower in the ischemic vs. non-ischemic central RVO patients. 5-oxo-ETE attenuated aortic ring and choroidal explant sprouting, and inhibited tubule formation and migration of HRMECs in a dose-dependent manner, possibly through suppressing the vascular endothelial growth factor-induced signaling pathways.

**Conclusions:** The plasma levels of  $\omega$ -6 and  $\omega$ -3 LCPUFA and their oxylipins were associated with RVO. The  $\omega$ -6 LCPUFA-derived metabolite 5-oxo-ETE was a potential marker of RVO development and progression.

**Key words** Long-chain polyunsaturated fatty acid; Oxidative metabolism; Retinal vein occlusion; Retinal neovascularization; 5-oxo-eicosatetraenoic acids

# 通过调节 PRMT-1/DDAH/ADMA 通路和调节肠道微生物组，膳食补充 *Caulerpa racemosa* 的心脏保护作用：对小鼠的临床前试验研究

## Cardioprotective effect of dietary supplementation of *Caulerpa racemosa* via regulation of PRMT-1/DDAH/ADMA pathway and modulation of the gut microbiome: A preclinical trial study on mice

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**Background and objectives:** Alternative approaches based on natural bioresources are important in treating cardiometabolic syndrome. This study evaluated the effects of an aqueous extract of *Caulerpa racemosa* (AEC) on markers of cardiometabolic syndrome and modulation of gut microbiome in mice on cholesterol- and fat-rich diets (CFED). Properties of the AEC such as antioxidants (ABTS and DPPH) and inhibition of food hydrolyzing enzymes (lipase,  $\alpha$ -amylase, and  $\alpha$ -glucosidase) were also determined *in vitro*. **Methods:** A total of forty mice were divided into four groups. Group A was given a normal diet, Group B was given a CFED diet, and Groups C and D were given CFED diet and orally-administered AEC extract at 65 and 130 mg/kg BW, respectively. After 6 weeks of intervention, mice were euthanized, blood with cardiac tissue, and fecal samples were collected for further analysis. **Results:** The effective concentration ( $EC_{50}$ ) values of AEC were 116.9, 121.7, and 137.9  $\mu$ g/mL for DPPH, ABTS, and lipase inhibition, respectively, and were more effective than controls *in vitro*. In the mice model, the administration of 130 mg/kg BW AEC was significantly more potent in improving blood lipid and glucose profiles, oxidative stress, and inflammation characterized by up-regulation of superoxide dismutase enzyme, PGC-1 $\alpha$ , and IL-10 as well as a lower level of TNF- $\alpha$  ( $p=0.001$ ). Interestingly, the expression of PRMT-1 and ADMA were downregulated by AEC, as well as upregulating DDAH-II significantly ( $p<0.05$ ). Furthermore, a correlation between specific gut microbiomes and biomarkers related to cardiometabolic diseases was also revealed ( $p=0.001$ ). **Conclusions:** *Caulerpa racemosa* has potential *in vitro* antioxidant properties as a promising functional food ingredients. The *in vivo* demonstrated the role of AEC in the management of cardiometabolic syndrome via the regulation of oxidative stress, inflammation, endothelial function (PRMT-

1/DDAH/ADMA pathway), and by modulating gut microbiota. Further human clinical trials are needed for the foreseeable future.

**Key words** Cardiometabolic Syndrome, *Caulerpa racemosa*, PRMT-1/DDAH/ADMA Pathway, Gut Microbiota, Cardioprotective

# 超重对青年人脂肪餐后脂联素、超敏 C 反应蛋白的影响及性别差异

## Effect of overweight on lipocalin and ultrasensitive C-reactive protein after adipose meal in young adults and gender differences

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### Objective

To measure fasting and postprandial lipocalin (APN) and hypersensitive C-reactive protein (hs-CRP) in young people with different body mass index (BMI), and to analyze and assess the effects of overweight on postprandial APN and hs-CRP levels in young people and gender differences.

### Methods

A total of 113 cases, aged  $18.8 \pm 1.6$  years (18-21 years), 42 males and 71 females were included. The concentrations of APN and hs-CRP were measured 2 hours after fasting and fat meals, and the association between APN and hs-CRP and BMI and gender differences were analyzed.

### Results

The fasting and 2h postprandial APN (mg/L) of 113 young people were  $0.98 \pm 0.39$  and  $1.52 \pm 0.61$ , respectively, and the 2h postprandial APN was higher than the fasting APN level ( $P < 0.05$ ). As BMI increased, fasting and 2h postprandial APN decreased, and plasma APN concentrations were similar in men and women in the three BMIs. there was a negative correlation between BMI and fasting and 2h postprandial APN ( $P < 0.05$ ). Fasting and 2h postprandial hs-CRP (mg/L) were  $0.53 \pm 0.36$  and  $0.74 \pm 0.57$  in the three BMI subgroups, respectively, and 2h postprandial CRP was higher than fasting hs-CRP levels ( $P < 0.05$ ). Both fasting and 2h postprandial hs-CRP concentrations were positively correlated with BMI values ( $P < 0.05$ ), and both fasting and 2h postprandial hs-CRP levels gradually increased with increasing BMI. In the subgroup with BMI  $\geq 24$ , fasting and 2h postprandial hs-CRP were higher in men than in women ( $P < 0.05$ ). Lipocalin and hs-CRP were negatively correlated ( $P < 0.05$ ).

### Conclusion

Higher BMI is detrimental to postprandial lipocalin secretion, and adipose postprandial inflammatory response is more severe in young men with overweight BMI than in women. Overweight and gender are important factors influencing adipose postprandial lipocalin secretion and hs-CRP production in young adults.

**Key words** Ultrasensitive C-reactive protein; Lipocalin; Body mass index; Fat meal; Youth

# 成人膳食炎症指数与胆结石的关系

## Association between Dietary Inflammatory Index and Gallstones in Adults

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**Background and objectives:** Gallstones are significantly correlated with diet and inflammation. However, the relationship between dietary inflammatory index (DII) and gallstones is unclear. The objective of this study was to investigate the relationship between DII and gallstones.

**Methods:** Data were obtained from the 2003–2020 National Health and Nutrition Examination Survey (NHANES). The second 24-h dietary recall interview data and the medical condition questionnaire data were used to calculate DII and determine gallstone history, respectively. To lessen selection bias, we utilized a 1:1 ratio for propensity score matching (PSM) by nearest neighbor matching. We analyzed the relationship between DII and gallstones using multifactorial regression. Restricted cubic curve (RCS) models were used to analyze the non-linear relationship. BMI subgroup stratification was performed to explore further the connection between DII and gallstones in different populations.

**Results:** 10,779 participants were included, of which the median DII was 1.25 (IQR=2.73), and about 11% (1213) of participants had a history of gallstones. Before and after PSM, univariate analysis showed that DII was higher in the gallstone group than in the non-gallstone group. Matched logistic regression analysis showed that DII scores were positively correlated with gallstone risk after adjusting for all confounding factors (OR=1.14, 95% CI 1.01, 1.29). RCS analysis suggested that DII and gallstones showed a "J"-shaped non-linear dose-response relationship ( $P$  non-linear < 0.001). The stratified analysis further found that DII was a significant risk factor for people with BMI  $\geq 25$  kg/m<sup>2</sup> (OR=1.18, 95% CI 1.03, 1.34).

**Conclusions:** Our findings suggest that higher DII scores are positively associated with the risk of gallstones and that there is a non-linear relationship between DII and gallstones, which is particularly significant in those with a BMI  $\geq 25$  kg/m<sup>2</sup>. These results further support that avoiding or reducing a pro-inflammatory diet can be an intervention strategy for gallstone management.

**Key words** Dietary inflammatory index; Gallstone; Propensity score matching; Restrictive cubic spline; NHANES

Category: Clinical Nutrition

# 紧张性木僵患者的营养治疗

## Nutritional therapy for Patients with Catatonia

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**Objective:** To enhance clinical understanding of nutritional therapy for patients with Catatonia, providing optimal nutritional support to improve disease progression.

**Methods:** Patients with Catatonia often experience difficulties with oral intake and swallowing disorders, leading to reduced food intake and increased risk of malnutrition. By analyzing the nutritional status of patients with Catatonia and combining nutritional screening, assessment, and diagnosis, individualized nutritional treatment plans are proposed.

**Results:** Early nutritional assessment and enhanced oral nutritional support should be provided for patients with Catatonia. Nutritional screening using the Nutritional Risk Screening (NRS2002) tool, nutritional assessment based on the Global Leadership Initiative on Malnutrition (GLIM) criteria, and swallow function assessment using the water swallow test should be employed. Dietary surveys should be conducted, along with collection of relevant medical and medication history related to nutrition, as well as assessment of nutrition-related clinical symptoms and pertinent laboratory indicators. For energy supply, a simple formula based on weight estimation is recommended, with energy requirements estimated at  $25\text{--}30 \text{ kcal}\cdot\text{kg}^{-1}$  (actual body weight) $\cdot\text{d}^{-1}$ . For bedridden patients, energy requirements should be estimated at  $20\text{--}25 \text{ kcal}\cdot\text{kg}^{-1}$  (actual body weight) $\cdot\text{d}^{-1}$ . Appropriate feeding methods should be chosen. The enteral nutrition prescription was selected based on the patient's nutritional status.

**Conclusion:** Clinical nutrition therapy should enhance understanding of Catatonia to enable better diagnosis and treatment of patients.

**Key words** Nutritional therapy, Catatonia, Clinical nutrition



# 间歇性禁食作为一种营养方法用于体重管理和预防肥胖及代谢性疾病

## Intermittent fasting as a Nutrition Approach for weight management and againsting Obesity and Metabolic Disease

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Obesity and its related diseases pose important global public health, financial, and social issues. Intermittent fasting (IF), as a dietary regulation mode, can reduce weight, reduce oxidative stress, improve cognitive ability, and delay aging. IF has been proposed as a potential nutritional method to combat obesity and metabolic disorder.

The aim of this study is to determine the long-term effectiveness of IF in weight loss and metabolic health; Compare the weight loss effects of different dietary patterns during fasting days. We recruited obese and pre diabetes adults with fasting lifestyle, and divided them into obese control group; Obesity fasting group; Pre diabetes control group; There were 4 groups of pre diabetes fasting group, 6 people in each group. According to the hunger score, the start time and end time of fasting were scientifically set. The average fasting time was 42 hours a week. The obese fasting group and the pre diabetes fasting group were given fasting intervention for 6 weeks. The control group maintained normal living habits. All volunteers in this study signed informed consent forms.

Research results: After 6 weeks of intervention, all fasting groups lost an average weight of 4.12 kg. The FBG or mean OGTT glucose levels in the fasting group in pre diabetes were significantly lower than those in the control group ( $p < 0.05$ ). TG, TCHOL, and insulin production index increased in the fasting group, while SBP/DBP decreased in the fasting group; There is no significant change in heart rate and pulse.

Conclusion: As an alternative nutrition method to fight obesity and Metabolic disorder, IF has been widely studied. IF can lead to clinically significant weight loss and improve glucose and lipid metabolism. However, adhering to IF may be challenging. Preliminary data indicates that for obese patients with insulin resistance, IF can improve insulin resistance.

**Key words** Time-restricted eating; Insulin; Nutritional measures; Obesity; Metabolic disorder

# 中国乳腺癌化疗患者的肌少性肥胖状况及特点

## The Sarcopenic Obesity Status of Chinese Breast Cancer Patients Undergoing Chemotherapy

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### Objectives

To evaluate the sarcopenic obesity status of Chinese breast cancer patients undergoing chemotherapy.

### Methods

This is a cross-sectional study, and with stage I-III primary breast cancer patients receiving chemotherapy in outpatient or inpatient departments at three hospitals in Beijing were selected using a convenience sampling method. Standard tools were used to measure the physical condition of breast cancer patients. Body mass index (BMI), waist circumference (WC) and body fat percentage (% BF) were used to evaluate the obesity of patients. Appendicular skeletal muscle mass index (ASMI) and hand grip strength (HGS) were used to evaluate the muscle loss. Combined obesity and muscle loss related indicators were used to determine the sarcopenic obesity. The Kappa consistency test was used to evaluate the consistency of obesity, muscle loss and the sarcopenic obesity.

### Results

A total of 142(41.6%) patients with BMI  $>24\text{kg}/\text{m}^2$ , 50(14.7%) patients with BMI  $\geq 28\text{kg}/\text{m}^2$ , 169 (49.3%) patients with WC  $\geq 85\text{cm}$ . The simple Kappa coefficients are 0.462 and 0.441. A total of 235(67.7%) patients were obese among 347 patients. 74 (21.4%) breast cancer patients were in the group of ASMI  $< 5.7\text{ kg}/\text{m}^2$ , and 52 people (15.0%) with HGS  $< 18\text{kg}$ . The Kappa value of the consistency test was 0.171. Reduce muscle mass or muscle strength combined with obesity to form two sarcopenic obesity criteria. There were 29 (8.4%) who met sarcopenic obesity (criterion 1) and 34 (9.8%) who met sarcopenic obesity (criterion 2). The Kappa test was used to test the consistency between the two criteria and the Kappa coefficient was 0.184.

### Conclusions

Breast cancer patients undergoing chemotherapy had nutritional problems with obesity, reduced muscle mass and decreased muscle strength and a certain percentage of breast cancer patients had sarcopenic obesity.

**Key words** breast cancer, sarcopenic obesity, chemotherapy

# 大豆卵磷脂-没食子酸复合物通过铁死亡增强人非小细胞肺癌的放射敏感性

## The Soybean Lecithin-Gallic Acid Complex Enhances Radiosensitivity of Human Non-Small Cell Lung Cancer Through Ferroptosis

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**Background and Objectives:** Gallic acid (GA) is a type of polyphenolic compound found in various plants and foods. It has been shown to possess anticancer properties, including the inhibition of tumor cell proliferation and the enhancement of tumor cell sensitivity to cisplatin. This study aimed to investigate whether the soybean lecithin complex of gallic acid (SL-GAC) can enhance the radiosensitivity of human non-small cell lung cancer (NSCLC) by inducing ferroptosis and its related mechanisms.

**Methods and Study Design:** In this study, we used SL-GAC in combination with ionizing radiation (IR) to treat the A549 cell line. The effects of SL-GAC on the proliferation, migration, and invasion of A549 cells were evaluated using cell viability CCK-8, EDU staining, wound healing assay, and clone formation experiment. The levels of oxidative stress and mitochondrial damage were measured using flow cytometry to detect mitochondrial membrane potential (MMP) and reactive oxygen species (ROS), and fluorescence microscopy to observe malondialdehyde (MDA) levels and mitochondrial integrity. Western blotting was used to detect proteins related to ferroptosis.

**Results:** The results showed that compared with treatment with IR or SL-GAC alone, the combination of SL-GAC and IR significantly inhibited the proliferation and migration of A549 cells and caused more severe oxidative stress and mitochondrial damage, indicating that SL-GAC had a radiosensitization effect. Further studies found that the combined treatment could induce ferroptosis in A549 cells, and the radiosensitization effect could be inhibited by the ferroptosis inhibitor Fer-1, indicating that ferroptosis is an important mechanism underlying SL-GAC-induced radiosensitization of A549 cells.

**Conclusions:** In conclusion, our study suggests that SL-GAC may be a potential radiosensitizer for enhancing radiotherapy efficacy in patients with non-small cell lung cancer. Further validation is needed through preclinical and clinical studies.

**Key words** gallic acid; non-small cell lung cancer; ionizing radiation; radiosensitivity

## 中等剂量维生素 K 摄入有利于 50 岁以上人群骨骼健康：一项基于 NHANES 的研究

### Medium level of vitamin K intake contributes to the bone health of people 50 years and older: a NHANES-based survey

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**Objective:** To explore whether higher levels of VK intake contribute to the reduction of the risk of osteoporosis and bone loss in the US population over 50 years old. **Methods:** Total 5075 subjects from four NHANES cycles (2007–2008, 2009–2010, 2013–2014 and 2017–2020) were included. VK intake was divided into three groups (high, medium and low) by gender and tertile, with multiple weighted logistic regression used to investigate the effect of VK intake on the risk of osteoporosis and bone loss at five sites: femoral neck, trochanter, intertrochanter, total femur and lumbar spine and overall. **Results:** In total 1001 (18% weighted) had osteoporosis (808 females, 83% weighted), and 2226 (46% weighted) had osteopenia (1076 females, 54% weighted). Among females, the low level group had lower bone mass density and higher prevalence of osteoporosis than higher levels groups, which were not found in males. Furthermore, higher levels were associated with a reduced risk of osteoporosis in females, which remained in fully adjusted model, as well as overall and at the femoral neck and lumbar spine. Additionally, medium level was related to a decreased risk of bone loss in all five models overall and at the trochanter, intertrochanter, total femur and lumbar spine. However, in males, only medium level was associated with reduced bone loss at the femoral neck, and high level corresponds to the lumbar spine. **Conclusions:** The medium level of VK intake was beneficial in reducing the risk of osteoporosis and bone loss in females over 50 years old and was beneficial in reduced bone loss in males of same age. Medium level of VK intake is recommended to people aged 50 years and older to maintain bone health.

**Key words** Vitamin K; Osteoporosis; Bone Loss; Bone Health; National Health and Nutrition Examination Survey (NHANES)

Category: Clinical Nutrition

## 个体化医学营养治疗联合药物对肥胖型多囊卵巢综合征患者影响的临床研究

### Clinical Study on the Effect of Individualized Medical Nutrition Therapy Combined with Drugs on Obese Polycystic Ovarian Syndrome Patients

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**Objective:** To study the effects of medical nutritional therapy combined with drugs on body composition, endocrine metabolism, and reproductive function in patients with obese polycystic ovary syndrome (PCOS), and to provide clinical basis and management experience for the treatment of obese PCOS.

**Method:** Through a PCOS joint outpatient clinic consisting of clinical nutrition, endocrinology, and gynecology departments, 50 obese PCOS patients were treated with personalized medical nutrition combined with medication at Shanghai 10th People's Hospital from December 2020 to June 2021. Paired sample t-tests were conducted on the body composition, endocrine and metabolic indicators, and reproductive indicators of the patients before and after treatment.

**Results:** After 16 weeks of intervention, obesity indicators such as body weight, body mass index, waist circumference and body fat percentage were significantly reduced ( $P < 0.05$ ), endocrine metabolic indicators such as fasting insulin, Fasting blood sugar, insulin resistance index, total cholesterol, triacylglycerol and low-density lipoprotein cholesterol were significantly reduced ( $P < 0.05$ ), and reproductive function indicators such as free testosterone, Luteinizing hormone and Luteinizing hormone/follicle stimulating hormone were significantly reduced ( $P < 0.05$ ), 81.5% of patients have improved and returned to normal menstrual cycles.

**Conclusion:** After 16 weeks of intervention, the combination of medical nutrition intervention and medication can effectively reduce the weight and body fat percentage of PCOS patients, and significantly improve endocrine metabolism and reproductive function. It is an effective method for treating obese PCOS.

**Key words** Obese, Polycystic Ovarian Syndrome, endocrine metabolism, reproductive function

# 多频生物电阻抗法评估住院患者不同年龄人体成分分析研究

## The multi-frequency bioelectrical impedance method to investigate age difference in body composition in inpatients

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**Objective** To analyze the differences in body composition such as protein, water, fat, and muscle content of different age in inpatients.

**Methods** The total of 202 inpatients in Shanghai Tenth People's Hospital from September 2020 to December 2020 were enrolled in this study. All participants were grouped according to the age and measured body composition such as body fat percentage, body water, muscle mass, protein, and visceral fat area, and compared body composition differences between different ages.

**Results** There were statistically significant differences in the comparison of calf circumference, grip strength, ECW/TBW, TBW/FFM in different ages ( $P < 0.05$ ). With the increase of age, the risk of malnutrition (NRS 2002  $\geq 3$  points) turned to an increased trend (7.1%, 8.1%, 9.9%,  $P < 0.05$ ). However, intracellular water (ICW), total water (TBW), protein, minerals, fat-free body mass (FFM), body cell mass (BCM), bone mineral content, arm circumference (AC), arm muscle circumference (AMC) and basal metabolic rate (BMR) turned to a decreased trend with increasing age. Calf circumference was positively correlated with protein, FFM, AC, AMC, SMI, waist circumference, and BMR; the grip strength is positively correlated with protein, FFM, AMC, SMI, and BMR. The correlations between albumin, pre-albumin, total protein and the risk of malnutrition is weak, showing a trend of negative correlations.

**Conclusion** Between different ages, the various components of the human body are different. As the age group grows, the indexes of calf circumference, grip strength, body water content, intracellular water, extracellular water, muscle mass, and protein showed a downward trend with age. Calf circumference and grip strength were positively correlated with protein-related body composition indexes (i.e. protein, FFM, AC, AMC, SMI, BMR).

**Key words** body composition; age; inpatients

## 营养炎症因素预测可切除胰腺癌患者的短期预后

# The nutritional and inflammatory factors predict short-term outcomes of patients with resectable pancreatic cancer

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Background: The association between nutritional and inflammatory factors and prognosis has been investigated in patients with resectable pancreatic cancer (PC). However, simple and practical prognostic markers of PC are still limited and unprecisely. Methods: We conducted a retrospective observational research involving 201 patients with resectable PC undergoing elective pancreatic surgery in the First Affiliated Hospital of USTC from January 2019 to April 2023. The nutritional and inflammatory factors were collected and calculated from the hospital electronic database. The univariate analysis and logistic regressions were used for prognostic factors. Results: The mean age was  $62.33 \pm 9.97$  years. The regressions revealed that preoperative AGR ( $P=0.007$ ), LMR ( $P=0.010$ ), SIRI ( $P=0.011$ ), SII ( $P=0.011$ ), and NRS2002 ( $P=0.001$ ) were associated with length of hospital stay after operation in patients with resectable PC. NRS2002 was also the predictor for intra-abdominal hemorrhage (OR, 0.080, 95%CI 0.008–0.811,  $P=0.033$ ). However, the relationships between the nutritional and inflammatory markers and 30-day readmission and complication were not found. Conclusion: It is necessary to select appropriate assessment tools and combine laboratory markers to accurately assess patients' systemic status, and further guide individualized treatment, improve prognosis of patients with resectable PC.

**Key words** pancreatic cancer; surgical resection; nutritional and inflammatory factor; prognosis

Category: Clinical Nutrition

# 出生体重与脐动静脉血中维生素水平的关系

## Relationship between birth weight and vitamin levels in umbilical artery and vein blood

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**Objective:** To compare the difference of vitamin levels in umbilical vein blood and artery blood, and to analyze the relationship between vitamin levels in umbilical vein blood and artery blood and birth weight. **Methods:** 101 pairs of mothers and infants who were hospitalized in Danyang People's Hospital, Jiangsu Province from June to September 2021 were recruited. The umbilical vein blood and artery blood of the newborn were collected after birth, and the levels of vitamin A, vitamin B1, vitamin B2, niacinamide, pantothenic acid, free folic acid, vitamin D, vitamin E, and vitamin K1 in umbilical vein blood and artery blood were detected by liquid chromatography and mass spectrometry (LC-MS/MS). The levels of vitamin B12 in umbilical blood were detected by electrochemiluminescence. **Results:** The levels of vitamin B2, vitamin A, vitamin E and 25-(OH)-VD3 in umbilical vein blood were higher than those in umbilical artery blood, and the levels of vitamin B12, free folate and vitamin B1 were lower. The levels of vitamin K1 and 25-(OH)-D2 were below the detection limits. Linear regression results showed that the logarithmic values of vitamin A in umbilical vein blood and artery blood were positively correlated with birth weight, while the difference of vitamin levels in umbilical vein and artery blood was not statistically correlated with birth weight. **Conclusion:** The levels of vitamins were different between umbilical artery and vein blood, and the levels of vitamin B12, free folate and vitamin B1 are lower. The logarithmic values of vitamin A in umbilical vein blood and artery blood were positively correlated with birth weight, while the difference of vitamin levels in umbilical vein blood and artery blood were not statistically correlated with birth weight.

**Key words** umbilical artery blood, umbilical vein blood, birth weight, vitamin



# 活动性肺结核患者的营养状况研究及新营养风险筛查模型的建立在结核病患者中的应用：一项全国性、多中心大样本研究

## Nutritional status in patients with active pulmonary tuberculosis and new nutritional risk screening model for active tuberculosis: a national, multicenter study in China

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### Abstract

**Background:** Tuberculosis (TB) remains a significant challenge for public health and is closely associated with malnutrition; however, few studies have attempted to screen malnutrition among TB patients. The study aimed to evaluate the nutrition status and build a new nutritional screening model for active TB.

**Methods:** A retrospective, multicenter, large cross-sectional study was conducted in China from 1 January 2020 to 31 December 2021. All included patients diagnosed with active pulmonary TB (PTB) were evaluated both by Nutrition Risk Screening 2002 (NRS 2002) and Global Leadership Initiative on Malnutrition (GLIM) criteria. Univariate and multivariate analyses were conducted to screen the risk factors associated with malnutrition, and a new screening risk model, mainly for TB patients, was constructed.

**Results:** A total of 14,941 cases meeting the inclusion criteria were entered into the final analysis. The malnutrition risk rate among PTB patients in China was 55.86% and 42.70%, according to the NRS 2002 and GLIM, respectively. The inconsistency rate between the two methods was 24.77%. A total of 11 clinical factors, including elderly, low body mass index (BMI), decreased lymphocyte cells, taking immunosuppressive agents, co-pleural TB, diabetes mellitus (DM), human immunodeficiency virus (HIV), severe pneumonia, decreased food intake within a week, weight loss and dialysis were identified as independent risk factors of malnutrition based on multivariate analyses. A new nutritional risk screening model was constructed for TB patients with a diagnostic sensitivity of 97.6% and specificity of 93.1%.

**Conclusions:** Active TB patients have severe malnutrition status according to screening by the NRS 2002 and GLIM criteria. The new screening model is recommended for PTB patients as it is more closely tailored to the characteristics of TB.

**Key words** Keywords: Nutritional risk; malnutrition; Nutrition Risk Screening 2002 (NRS 2002); Global Leadership Initiative on Malnutrition (GLIM); model

# 异基因造血干细胞移植患者经口能量及蛋白质达标情况及其相关因素分析：一项纵向研究

## The adequacy of oral energy and protein intake in patients undergoing allogeneic hematopoietic stem cell transplantation:a longitudinal study

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**Aims:** Understanding the oral energy and protein intake states and related issues in allogeneic hematopoietic stem cell transplantation(allo-HSCT) patients is essential for timely and effective nutritional intervention. This study aims at finding out the longitudinal adequacy of oral energy and protein intake and the incidence of nutrition impacted symptoms(NIS) to provide suggestions for the improvement of oral intake in allo-HSCT patients.

**Methods:** A single-center prospective study enrolled allo-HSCT patients from 2022 to 2023. We evaluate the adequacy of oral energy/protein intake and NIS in the peritransplantation period. Generalized estimating equations(GEE) were adopted to evaluate the association between longitudinal adequacy of oral energy/protein intake and demographic as well as disease and treatment characteristics.

**Results:** A total of 63 allo-HSCT patients were enrolled in the study with 439 records. The adequacy of oral energy/protein intake was significantly lower than that at admission and returned to the level on of admission on the day before discharge with the range of 39.3%-63.1%, and 27.4%-62.2%, respectively. 57.1%-95.2% of allo-HSCT patients suffered from at least one nutrition impacted symptoms in the peritransplantation period. GEE indicated that the presence of NIS was a risk factor significantly associated with the adequacy of oral energy intake<50%(OR=2.359, P=0.012), while the use of oral nutrition supplements (ONS) was a protective factor (OR=0.133, P<0.001). There were similar associations between the adequacy of oral protein intake<50% and the presence of NIS (OR=2.007, P=0.048) and the use of ONS(OR=0.387, P=0.001).

**Conclusion:** Insufficient oral energy and protein intake and the burden of NIS in peritransplantation patients is common and further attention and intervention on these issues are needed. ONS is a potential approach to increase oral intake and future studies may further explore the value of ONS in improving nutritional status in allo-HSCT patients.

**Key words** oral intake; adequacy; nutrition impacted symptoms; oral nutrition supplements; allogeneic hematopoietic stem cell transplantation

# 慢性阻塞性肺疾病患者营养筛查工具的比较：分层贝叶斯荟萃分析

## Comparison of Nutritional Screening Tools for Patients with Chronic Obstructive Pulmonary Disease: A Hierarchical Bayesian Meta-analysis

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[Abstract] Background and Objectives: Malnutrition is a common disorder in patients with chronic obstructive pulmonary disease (COPD) and has a high risk of mortality and emergency hospitalization. An accurate nutritional assessment is critical for the precise nutritional support strategy in COPD patients. Due to the lack of a gold standard, it is hard in choosing appropriate screening tools for COPD patients. Thus, this study aimed to assess the construct validity of nutritional screening tools for COPD patients, using hierarchical Bayesian latent-class meta-analysis approaches. Methods and Study Design: A systemic search of the databases PubMed, EMBASE, SinoMed, China National Knowledge Infrastructure, and Wanfang was undertaken, and studies satisfying inclusions and exclusions criteria were identified for further analysis. The pooled estimates of sensitivity, specificity, diagnostic odds ratio, positive likelihood ratio (LR+), and negative likelihood ratio (LR-) were generated from the hierarchical summary receiver operating characteristic model. Results: A total of 9 eligible studies involving the mini-nutritional assessment (MNA), SGA, and NRS2002 were included. The pooled sensitivity was 0.92 (95% CI: 0.86-0.95) for MNA, 0.89 (95% CI: 0.85-0.92) for SGA, and 0.87 (95% CI: 0.65-0.96) for NRS2002, respectively. The pooled specificity was 0.90 (0.76-0.96) for MNA, 0.93 (0.89-0.95) for SGA, and 0.83 (0.78-0.88) for NRS2002, respectively. SGA has the highest LR+ 11.8 (95% CI: 8.0-17.4), MNA has the lowest LR- 0.09 (95% CI: 0.05-0.15) and NRS2002 has both the lowest LR+ 5.2 (95% CI: 3.5-7.7) and highest LR- 0.15 (95% CI: 0.05-0.48). Conclusions: This study demonstrated that MNA and SGA achieve good construct validity in screening the risk of malnutrition in COPD patients. Further large-scale prospective cohort studies are needed to refine these tools.

**Key words** chronic obstructive pulmonary disease; malnutrition; nutrition; nutritional screening; meta-analysis

# 孕期体重增长速率与出生结局的关联-基于中国 TAWS 队列研究

## Trajectory of gestational weight gain is related to birth outcomes: the TAWS cohort study in China

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**Background** Few studies have reported the timing and amount of gestational weight gain (GWG) to prevent large-for-gestational-age (LGA) or small-for-gestational-age (SGA). **Objectives** This study aimed to evaluate the association of GWG velocity with LGA or SGA based on data from the Taicang and Wuqiang cohort study (TAWS). **Study Design** Weight trajectories of 2008 women during pregnancy were plotted and fitted by cubic spline and linear mix-effect models. **Results** Compared with women who delivered appropriate-for-gestational-age (AGA) babies, women who delivered LGA had higher GWG velocities in the first trimester (0.112 kg/week vs 0.048 kg/week,  $P < 0.01$ ), second trimester (0.741 kg/week vs 0.622 kg/week,  $P < 0.01$ ), and third trimester (0.653 kg/week vs 0.576 kg/week,  $P < 0.01$ ), with similar results in normal-weight and overweight/obese women; in contrast, women giving birth to SGA had lower GWG velocities in the second trimester (0.502 kg/week vs 0.622 kg/week,  $P < 0.01$ ) and third trimester (0.522 kg/week vs 0.576 kg/week,  $P < 0.01$ ), with similar results in underweight and normal-weight women. In AGA or LGA groups, multiparous women had lower GWG velocities in the second and third trimesters than primiparous women ( $P < 0.01$ ), with similar results in normal-weight and overweight/obese women. **Conclusions** For overweight/obese and normal-weight women, LGA prevention should begin in early pregnancy and continue until delivery; for underweight and normal-weight women, the second and third trimesters may be critical periods for preventing SGA; and multiparous women may need less weight gain than primiparous women to achieve AGA or prevent LGA newborns.

**Key words** cohort study, gestational weight gain, birthweight, velocity

# 嘌呤饮食对帕金森病脑深部电刺激术预后的影响

## Effect of purine diet on prognosis of deep brain stimulation for Parkinson's disease

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Uric acid (UA) is a naturally occurring antioxidant that is strongly associated with the development and progression of Parkinson's disease (PD). The purine diet is an important exogenous pathway that modulates blood UA levels. Deep brain stimulation (DBS) is an important tool for PD treatment. This study aimed to explore the effects of preoperative purine diet on the prognosis of patients with PD after DBS. 64 patients with PD who underwent DBS were included in this study, and their demographic data, clinical symptom scale scores, blood UA values, and daily purine intake over 1 year were collected. Patients were followed up for improvement in motor symptoms 1 year after surgery. Using univariate and multivariate regression analyses, we found that patient higher purine intake was strongly associated with the rate of improvement after DBS and was a protective factor for patient prognosis. Daily purine intake from meat and seafood was significantly higher in the responsive patients than in the less-responsive patients. Mediation analysis showed that UA mediated 78% of the effect of purine intake on motor symptom improvement after DBS. We also analysed the effects of purine intake on functional brain connections in patients with PD and found that 25 brain regions with 27 functional connections were associated with purine intake. In summary, we observed that purine intake is strongly associated with the rate of improvement in motor symptoms after STN-DBS in patients with PD. This study provides a reference for preoperative diet planning in patients with Parkinson's disease undergoing DBS.

**Key words** Purine diet, Parkinson's disease, Deep brain stimulation, Brain connectivity

# 多学科团队决策管理可以改善营养不良老年住院患者的短期预后： 一项多中心、随机、对照研究

## The Multidisciplinary Team Decision-making Management of Malnutrition Improves Short-term Prognosis in Older Inpatients: A Multicenter, Randomized, Controlled Study

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### Objective

Malnutrition is a common geriatric syndrome with a high prevalence, which leads to worse prognosis. We aimed to explore the effectiveness of a tailored optimum nutritional therapy in malnourished, older inpatients based on multidisciplinary team (MDT). The hypothesis is MDT intervention strategies may improve nutritional status, shorten hospital stay, reduce hospitalization costs and mortality in older inpatients.

**Methods** This is a prospective multicenter randomized controlled study. A total of 463 older patients over the age of 60 with or at risk of malnutrition were enrolled from six hospitals from February 2022 to October 2022. Eligible inpatients were randomized into a 1:1 ratio, with one group receiving a MDT intervention and the other group receiving standard medical treatment. The primary outcome was nutritional status based on changes in MNA-SF scores at 3 months after discharge. K-M curve and multivariate COX regression equation were used for survival analysis. **Results** The mean age was 75.52 years old and 50.76% were women. There was no significant difference in nutritional status, mortality, length of stay, hospital costs between the two groups at 3 months after discharge. There was a significant difference in the mortality rate at 3 months after discharge between frail and non-frail older patients (HR 0.352, 95% CI 0.136 – 0.914;  $p=0.039$ ). COX regression showed that after adjusting the baseline nutritional level, lifestyle, cognition, psychology, comorbidity and polypharmacy, the MDT decision-making model could reduce the three-month mortality risk by 81.5% in older patients with malnutrition. **Conclusion** The MDT decision-making model improves short-term prognosis in older malnourished inpatients, especially those with frailty and prefrailty, which indicates that early nutrition screening and comprehensive nutrition assessment should be carried out and MDT decision-making model of nutrition support should be launched for older inpatients with malnutrition, especially in frail and prefrail patients.

**Key words** Older adults, malnutrition, frailty, multidisciplinary team

## 可活动癌症患者中肌肉量减少评价指标的比较：一项中国横断面研究

### Comparison of different methods of muscle mass evaluation among ambulatory cancer patients: a cross-sectional study in China

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**Background and aims:** Muscle mass reduction (MMR) is one of the three etiologic criteria in the Global Leadership Initiative on Malnutrition (GLIM) framework. Multiple methods are being used to evaluate muscle mass. This study aimed to compare different methods that evaluate MRR.

**Methods:** A single-center cross-sectional study was conducted. All participants underwent calf circumference (CC) measurement, bioelectrical impedance analysis (BIA), computed tomography (CT) based measurement and hand grip measurement. MRR was identified by low CC, low fat-free mass index (FFMI) and low appendicular skeletal muscle index (ASMI) in BIA, low muscle mass index (MMI) in CT image at the level of lumbar vertebra 3 (L3) and low hand grip strength respectively. The correlation between low MMI and MMR diagnosed under different criteria were calculated. The correlation between MMR and one-year mortality was also evaluated.

**Results:** 312 cancer patients receiving outpatient intravenous treatment were evaluated. Of the 312 patients 62.8% (196/312) were male and 37.2% (116/312) were female. The median age of the patients was 59.0 years (range, 21–80y; interquartile range 52.0–65.0y). FFMI and SMI diagnosed by BIA correlated with MMI diagnosed by CT (Pearson Correlation 0.798, 0.738). Except for low hand grip strength ( $p=0.007$ ), no single indicator for MMR correlated with one-year mortality. However, combination of CC, FFMI, ASMI, and MMI correlated with one-year mortality.

**Conclusions:** FFMI and SMI diagnosed by BIA correlated with MMI diagnosed by CT, indicating that BIA can be a good choice in evaluating MMR. Low hand grip strength and MMR diagnosed using multiple methods indicated higher one-year mortality.

**Key words** body composition measurement, muscle mass reduction, mortality, cancer, hand grip strength

# 副干酪乳酪杆菌 207-27 介导肠-脑轴改善健康成年人睡眠和情绪 *Lactobacillus. Paracasei* 207-27 mediate the gut-brain axis alleviating sleep and mood in healthy adults

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**Background** The research on regulating sleep quality and mood by probiotics via gut-brain axis is attracting attention. **Objective** A randomized, double-blind, and placebo-controlled trial was conducted to determine the effects of *L. paracasei* 207-27 on sleep and mood and its accompanying mechanisms in healthy adults. **Method and study design** Healthy adults aged 18-35 years old, consumed *L. paracasei* 207-27 or placebo for 4 weeks. Fecal samples, blood samples and questionnaires were collected at baseline and the end of ingestion. Sleep quality were measured using the Pittsburgh PSQI and Bracelet; depression and anxiety were measured by the self-rating SDS and SAS; inflammatory markers (TNF- $\alpha$ , IL-1 $\beta$  and IL-6), adrenocorticotrophic hormone (ACTH), corticotropin releasing hormone (CRH), Cortisol (COR),  $\gamma$ -aminobutyric acid (GABA) and 5-hydroxytryptamine (5-HT) were determined using enzyme-linked immunosorbent assay; the short chain fatty acids (SCFAs) were determined using GC-MS analysis; the gut microbiota was analyzed using 16S rRNA sequencing and bioinformatics. **Results** This study demonstrated that the probiotics group showed greater improvement in sleep quality than the placebo group. Significant changes in the structure of the gut microbiota were observed in the probiotics group, with a significant increase in the relative abundance of *Bacteroidota*, *Blautia* and *Faecalibacterium*, and a significant decrease in the relative abundance of *Proteobacteria*, *Dialister* and *Collinsella*. The probiotics group significantly increased the Chao1 and Observed species compared to placebo. The probiotics group significantly increased the acetic acid, isovaleric acid and propionic acid level compared to placebo. Contrary to placebo, probiotics group significantly increased serum GABA and 5-HT levels and decreased serum CRH level. **Conclusion** In addition to improving sleep quality, *L. paracasei* 207-27 induced alterations in the gut microbiome. The mechanisms may be relevant to the modulation of the gut microbiome along the gut-brain axis, including the dysregulation of HPA axis activity and the elevation of neurotransmitters and SCFAs levels.

**Key words** Sleep quality, mood, gut microbiota, probiotics, brain-gut axis



# 生酮饮食联合雷帕霉素抑制脑胶质瘤生长

## Ketogenic diet Combined with Rapamycin Inhibits Glioma Growth

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**Back ground & Aims:** The ketogenic diet(KD) is characterized by high fat, low carbohydrates and moderate amounts of protein, and exerts its anti-cancer effects with energy supply as the starting point, but due to the significant difference in effectiveness, it may be more effective as a combination adjunct. In this study, the effects of ketogenic diet combined with rapamycin on glioma in vivo and in vitro were observed, and the possible mechanism was discussed.

**Methods:** 1. The MTT assay determine the effect of Ketogenic environment(KE) on the growth of U87-MG cells, and the scratch test was used to determine the effect of KE on the migration of U87-MG cells. 2. The weight, blood glucose, blood ketones, and tumor volume of nude mice were detected after nude mice transplant tumor model been established. 3. The expression of mTOR and p-mTOR in cells and tumors were identified by Western Blot, and the levels of VEGF in serum and cell culture medium were determined by ELISA.

**Results:** 1.KE combined with RAPA can inhibit the growth and proliferation of U87-MG cells and slow down the migration rate. Reduces the secretion of cellular VEGF levels; The combination of high concentrations of B-HB and RAPA in a low-glucose environment inhibits cellular mTOR phosphorylation. 2. KD combined with RAPA can reduce blood glucose, increase blood ketones, block mTOR phosphorylation, and delay the growth of subcutaneous transplantation tumors in nude mice. However, the serum VEGF level of the model did not decrease, which may be related to the activation of angiogenic mimicry in extreme environments.

**Conclusion:** The combined application of KD and RAPA shows obvious advantages over the inhibitory effect on glioma, the mechanism may be that the two synergistically enhance the inhibition of mTOR kinase activation, cut off the downstream signaling molecule conduction chain, reduce the expression level of VEGF, or activate physiological functions.

**Key words** ketogenic diet; Cancer; glioma; rapamycin; nutrition; VEGF

Category: Clinical Nutrition

## **SARC-F 和 SARC-CalF 肌肉衰减症筛查量表在肺部恶性肿瘤住院患者中的验证性研究**

### **The validation of SARC-F and SARC-CalF questionnaire to screen sarcopenia among lung cancer inpatients**

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**Background and Objectives:** The SARC-F and SARC-CalF questionnaire are useful tools recommended in the Asian Working Group for Sarcopenia (AWGS) sarcopenia-diagnosing algorithm. This study aimed to validate their screening accuracy to screen sarcopenia among lung cancer inpatients.

**Methods and Study Design:** This was a cross-sectional study included 126 inpatients with lung cancer. Questionnaires, anthropometry and body composition measurement were conducted by trained investigators. According to AWGS2019, sarcopenia was defined for patients with low skeletal muscle index as well as either reduced hand grip strength or slow gait speed. The sensitivity and specificity of the SARC-F and SARC-CalF were calculated. Receiver-operating characteristic analysis was performed to calculate and compare the area under the curve.

**Results:** The inpatients had a mean age of  $65.5 \pm 8.7$  years and 74.6% were men. Using the cutoff value of  $\geq 4$  points of SARC-F and  $\geq 11$  points of SARC-CalF, 5 (4.0%) inpatients were classified as persons at risk of sarcopenia by SARC-F and 26 (20.6%) by SARC-CalF. The overall prevalence of sarcopenia was 19.1%, with 19.2% in men and 18.8% in women. The SARC-F questionnaire had a sensitivity of 16.7%, a high specificity of 99.0%, and an AUC of 0.7216 for sarcopenia. The SARC-CalF questionnaire had a higher sensitivity of 54.2%, a specificity of 87.3% and a significantly higher AUC of 0.8352 ( $P=0.0286$ ) for sarcopenia.

**Conclusions:** The SARC-F questionnaire was of good validity. And the SARC-CalF questionnaire significantly improved its screening accuracy. Sarcopenia affects the health outcomes of lung cancer inpatients a lot. Therefore, the application of SARC-F and SARC-CalF questionnaire in lung cancer inpatients to promote the early case finding of sarcopenia is of great importance.

**Key words** SARC-F; SARC-CalF; sarcopenia; screening; validation

# 妊娠期糖尿病患者产后血糖异常的影响因素分析

## Predictive factors for postpartum glucose intolerance in women with gestational diabetes mellitus in a Chinese population

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### Aim

The aim of this prospective cohort study was to evaluate the risk factors for postpartum glucose intolerance (GI) in women with gestational diabetes mellitus (GDM), since there is limited data in postpartum Chinese women.

### Method

A total of 367 women with GDM were enrolled from the obstetrics outpatient department of Nanshan Maternal and Child Health Hospital in Shenzhen, between January and July in 2021. Of these, 288 (78.5%) underwent a 75-g oral glucose tolerance test (OGTT) at 6–10 weeks after delivery. Potential clinical risk factors for GI were analyzed by logistic regression analyses.

### Results

Of the 288 women, 169 (58.7%) were normal, and 119 (41.3%) developed postpartum GI. Of those 119 women, 5 (1.7%) were impaired fasting glucose (IFG), 93 (32.3%) were impaired glucose tolerance (IGT), and 3 (1.0%) were type 2 diabetes (T2DM). By univariate logistic regression analyses, age, the level of fasting glucose, OGTT 1h and OGTT 2h in antepartum OGTT, and insulin therapy were selected as risk factors for GI. Multivariate logistic regression analysis revealed that the level of OGTT 2h in antepartum OGTT was a significant factor that predicted GI after delivery (odds ratio, 2.105; 95% CI, 1.361–3.256;  $P=0.001$ ). Weight gain throughout pregnancy was marginal associated with an elevated risk for postpartum GI (odds ratio, 1.084; 95% CI, 0.989–1.189;  $P=0.086$ ).

### Conclusions

IGT is the major type of postpartum GI in the present study. Higher levels of OGTT 2h in antepartum OGTT may be a useful marker for identifying GDM women who are at high risk for postpartum GI. Additionally, less weight gain during pregnancy might reduce the risk of postpartum GI, and lose some weight after delivery to improve/delay postpartum GI or T2DM deserve more attention.

**Key words** 75-g oral glucose tolerance test, Gestational diabetes mellitus, Glucose intolerance, Postpartum, Weight gain

# 上海市养老院老年人肌少症和骨质疏松症共存的患病率及相关因素

## Prevalence and Associated Factors of Coexistence of Sarcopenia and Osteoporosis in older adults in a senior home in Shanghai

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**Background and Objectives:** Sarcopenia and osteoporosis share an underlying pathology and reinforce each other in terms of negative outcomes. The coexistence of sarcopenia and osteoporosis has been recently considered in some groups as a syndrome termed ‘osteosarcopenia’. The sequelae for an individual suffering from osteosarcopenia include a greater risk of falls, fractures, institutionalization and mortality. Osteosarcopenia is common in older adults. This present study aimed to clarify the prevalence of osteosarcopenia and its associated factors in older adults in senior homes.

**Methods and Study Design:** This cross-sectional study included 583 participants in a senior home in Shanghai (mean age  $85.0 \pm 6.6$  yrs). Osteoporosis history and relevant data were collected through questionnaire surveys and face-to-face interviews. In accordance with the Asian Working Group for Sarcopenia 2019 criteria, patients with possible sarcopenia were identified. MNA-SF was applied to assess their nutritional status. The influencing factors for osteosarcopenia were determined through multivariate analysis.

**Results:** Of the 583 participants, 47.2% had sarcopenia without osteoporosis, 5.5% had osteoporosis without sarcopenia, and 18.7% had osteosarcopenia. Univariate analysis revealed that potentially associated factors included age, gender, nutritional status, high level of nursing care, an exercise frequency of  $\geq 3$  times per week, stroke, number of comorbidities  $\geq 3$ , and coronary disease. After adjustment by potentially associated factors, advanced age (OR = 2.4; 95% CI = 1.1 to 5.3), women (OR = 3.5; 95% CI = 2.0 to 6.0), protein powder supplements (OR = 0.43; 95% CI = 0.18 to 0.99), risk of malnutrition / malnutrition (OR = 2.2; 95% CI = 1.4 to 3.5), and stroke (OR = 1.9; 95% CI = 1.2 to 3.0) were identified as independent explanatory factors of osteosarcopenia.

**Conclusions:** In conclusion, osteosarcopenia was prevalent among the elderly in senior homes; thus, healthcare professionals should be aware of the associated factors and provide appropriate treatments.

**Key words** Sarcopenia; osteoporosis; osteosarcopenia; AWGS 2019; older adult.

## 术后胃肠功能障碍后经外周静脉的中心静脉导管异位至奇静脉： 病例报道

### Spontaneous migration of peripherally inserted central catheter into the azygos vein during post-operative gastrointestinal dysmotility: A case report

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**Abstract:** The spontaneous migration of the PICC is the displacement of the PICC tip from a satisfactory documented position in the SVC into its adjacent veins after several days or months of PICC insertion, and most frequently occurs in the ipsilateral internal jugular vein. However, it is rarely reported to detect migration of PICC tip into the azygos vein in patients who suffered from gastrointestinal dysmotility after abdominal surgery. We report two cases of spontaneous malposition of PICC into the azygos vein here and discuss the predisposing factors and processing procedures of this condition.

**Methods:** Two female patients with pancreatic disease were inserted PICCs on the left limbs before the abdominal surgery. After the surgery, one patient suffered from gastroparesis, and the other suffered from constipation. The nurses found that blood could not be aspirated from the PICCs while normal saline could be injected through the PICCs smoothly. We identified the malposition of the PICC step-by-step, using ultrasound, intracavitary electrocardiogram (ECG), and chest X-ray, and confirmed that the tip of the PICC migrated into the azygos vein. The patients were placed in the semi-reclining position from the supine position, and blood could be easily aspirated from the PICC after flushing with the push-pause flush technique. Intracavitary ECG displayed the elevated P, indicating that the PICC tip re-entered the SVC and was at the lower 1/3 of SVC.

**Results:** The PICCs of the two patients functioned well afterward and were removed after the parenteral nutrition support was completed.

**Conclusion:** It is critical to assess the function of the PICC before every time of infusion. For patients who undergo abdominal surgery with PICC on the left side, when they had gastrointestinal dysmotility combined with PICC dysfunction, the possibility of spontaneous migration of PICC tip into the azygos vein should be considered.

**Key words** Peripherally inserted central catheter; Catheter migration; Catheter dysfunction; Azygos vein; post-operative gastrointestinal dysmotility

# **一例妊娠期持续性恶心呕吐合并溃疡性结肠炎孕妇的营养治疗**

## **Nutritional management of a pregnant woman with inflammatory bowel disease and persistent nausea and vomiting during pregnancy: A case report**

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**Background:** Nausea and vomiting of pregnancy (NVP) is a common condition during pregnancy. In most pregnant women the symptoms resolve at 16–20 weeks of gestation, whereas a few pregnant women may experience nausea and vomiting from the first trimester till the third trimester, bringing healthy risks for the mother and the baby. The situation may get worse if the mother has diseases that can affect her nutritional status, such as inflammatory bowel disease.

**Methods&results:** We present a case of a 39-year-old primipara with inflammatory bowel disease who suffered from persistent NVP from 5 weeks of gestation until the day of delivery. She experienced weight loss in the first trimester and insufficient weight gain in the early second trimester, as well as multiple micronutrient deficiencies and anemia during pregnancy. We advised her to avoid potential triggers of nausea, keep a diet dairy, eat small meals, avoid fasting for a long time or overeating, and avoid processed food, hard food and raw food. Steaming and simmering were recommended to make the food soft and easy to digest. Additionally, we asked the patient to try foods with high-quality protein (meat, fish or shrimp, eggs, yogurt or milk, and bean products) every day, and take 75 - 100 g of milk powder for pregnant women as an energy and nutritional supplement. She accepted regular nutritional monitoring at the department of clinical nutrition, which helped her to intake enough carbohydrates and high-quality protein and supplemented her deficient micronutrient timely. She finally gained proper weight before delivery, only experienced mild anemia in the third trimester, and had a good pregnancy outcome.

**Conclusion:** This case suggests that for pregnant women with multiple nutritional problems, nutritional monitoring and timely nutritional intervention plays an important part in reducing the risk of adverse pregnancy outcomes.

**Key words** Nausea and vomiting of pregnancy; Inflammatory bowel disease; Ulcerative colitis; Nutritional management; Compliance

# 上海市养老院老年人营养不良和肌少症共存的患病率及相关因素

## Prevalence and Associated Factors of Coexistence of Malnutrition and Sarcopenia in older adults in a senior home in Shanghai

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**Background and Objectives:** Malnutrition-sarcopenia syndrome (MSS) increases the risk of death to a higher degree than malnutrition or sarcopenia alone, although they are often overlooked and undertreated in clinical practice. This present study aimed to clarify the prevalence of MSS and its associated factors in older adults in senior homes.

**Methods and Study Design:** This cross-sectional study included 583 participants in a senior home in Shanghai (mean age  $85.0 \pm 6.6$  yrs). MNA-SF was applied to assess their nutritional status. In accordance with the Asian Working Group for Sarcopenia 2019 criteria, patients with possible sarcopenia were identified. The influencing factors for MSS were determined through multivariate analysis.

**Results:** Of the 583 participants, 24.9% had sarcopenia with normal nutrition, 6.7% had malnutrition risk without sarcopenia, 30.7% had malnutrition risk with sarcopenia, 0.2% had malnutrition without sarcopenia, and 10.3% had MSS. Univariate analysis revealed that potentially associated factors included high level of nursing care, an exercise frequency of  $\geq 3$  times per week, polypharmacy, number of comorbidities  $\geq 3$ , protein powder supplements, minerals and vitamin supplements, dysphagia, stroke, dementia, and history of fractures. After adjustment by age and potentially associated factors, an exercise frequency of  $\geq 3$  times per week (OR = 0.04; 95% CI = 0.01 to 0.16), minerals and vitamin supplements (OR = 0.16; 95% CI = 0.03 to 0.79), polypharmacy (OR = 2.02; 95% CI = 1.04 to 3.90), dysphagia (OR = 4.77; 95% CI = 2.39 to 9.51), and dementia (OR = 3.09; 95% CI = 1.59 to 6.00) were identified as independent explanatory factors of MSS.

**Conclusions:** In conclusion, MSS was prevalent among the elderly in senior homes; thus, healthcare professionals should be aware of the associated factors and provide appropriate treatments.

**Key words** Sarcopenia; malnutrition; malnutrition-sarcopenia syndrome; AWGS 2019; older adult.

# 循环棕榈酸水平和中国人群早发冠心病风险的相关性

## Circulating palmitic acids and the risk of premature coronary artery disease in Chinese patients

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**Background and Objectives:** Saturated fats may increase the levels of total cholesterol (TC) and low density lipoprotein-cholesterol (LDL-C), linking to the risk of coronary artery disease (CAD). In young patients, unhealthy dietary habits are significant associated with an increased risk of CAD. Palmitic acid is one of the most important saturated fatty acids. However, its role in the development of premature CAD in Chinese patients is still unclear. This case-control study aimed to explore the association between the circulating level of palmitic acid and the risk of premature CAD in Chinese patients.

**Methods and Study Design:** There were 182 patients with premature CAD ( $\leq 55$  or  $\leq 65$  years of age in men or women, respectively) and 173 age-matched controls included. Traditional cardiovascular risk factors were recorded. Serum palmitic acid levels were measured by ultra-performance liquid chromatography-mass spectrometry and their associations with premature CAD were analyzed by multivariate logistic regression analysis.

**Results:** There was a higher proportion of men, smoking, and diabetes in patients with premature CAD compared with controls. Furthermore, patients with CAD had higher serum palmitic acid, TC, and LDL-C levels, while lower levels of high density lipoprotein-cholesterol (all  $P < 0.05$ ). Serum levels of palmitic acid were mildly but significantly correlated with levels of TC and LDL-C. Multivariate logistic regression analysis revealed that serum palmitic acid (per  $10 \mu\text{mol/L}$ ,  $\text{OR} = 1.35$ , 95%  $\text{CI} = 1.12 - 1.63$ ) were independently associated with the risk of premature CAD in Chinese patients after adjusting for age, sex, smoking, blood glucose, and blood pressure. When further adjusting the levels of LDL-C, the association between palmitic acid and premature CAD was attenuated but still significant (per  $10 \mu\text{mol/L}$ ,  $\text{OR} = 1.20$ , 95%  $\text{CI} = 1.02 - 1.41$ ).

**Conclusions:** Higher circulating levels of palmitic acids are associated with the risk of premature CAD in Chinese patients. This effect may be partly mediated by increased levels of LDL-C.

**Key words** palmitic acids; risk factors; coronary artery disease; saturated fatty acid; young patients



# 非酯化脂肪酸和中国年轻冠心病患者发病风险的相关性

## Association between circulating non-esterified fatty acids and the risk of acute coronary syndrome in young Chinese patients

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**Background and Objectives:** Circulating non-esterified fatty acids (NEFAs) play an important role in normal nutritional metabolism, serving as the key sources of energy for much of the body, especially for the myocardium. However, it may impair endothelial function and cause coronary artery disease (CAD), while most previous studies were performed on elderly populations. This study aimed to investigate the association between circulating NEFAs and the risk of acute coronary syndrome (ACS) in young Chinese patients.

**Methods and Study Design:** We included a total of 202 young patients (age  $\leq 55$  years) with ACS and 192 age-matched individuals without CAD as controls in this case-control study. Traditional cardiovascular risk factors were recorded. Levels of serum NEFAs were measured by a commercial NEFAs assay kit.

**Results:** There was a higher proportion of men, smoking, and dyslipidemia in patients with ACS compared with controls. Furthermore, patients with ACS were with higher levels of TG and NEFAs, while lower levels of HDL-C (all  $P < 0.05$ ). Serum levels of NEFAs were mildly but significantly correlated with levels of low-density lipoprotein cholesterol, triglyceride, and high-sensitivity C-reactive protein. Multivariate logistic regression analysis revealed that male sex (odds ratios [OR]=6.54, 95% confidence interval [CI]=3.65–11.74), higher levels of TG (OR=1.839, 95% CI=1.15–2.943), and NEFAs (per 100  $\mu\text{mol/L}$ , OR=1.17, 95% CI=1.076–1.276) were independently associated with the risk of ACS in young patients. Receiver operating characteristic analysis showed that levels of NEFAs (area under the curve 0.607,  $P=0.0002$ ) had a significant diagnostic value for ACS in young patients.

**Conclusions:** Higher circulating levels of NEFAs are associated with the risk of ACS in young Chinese patients, independent of multiple conventional cardiovascular risk factors.

**Key words** non-esterified fatty acids; risk factors; coronary artery disease; acute coronary syndrome; dyslipidemia

Category: Clinical Nutrition

# **静脉脂肪乳剂在肠衰竭相关性肝病患儿的序贯应用**

## **The sequential application of lipid emulsions in PN in children with intestinal failure - associated liver disease**

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**Background:** Some studies have found that fish oil lipids in parenteral nutrition (PN) can alleviate intestinal failure-associated liver disease (IFALD). The aim of this study was to assess appropriately sequential application of intravenous lipids in PN and its effect on liver function in children with IFALD.

**Methods:** Twenty-six children with intestinal failure (IF) were recruited on sequential application of lipids from January 2014 to September 2022. 10% Fish oil lipid was introduced into PN when the value of three of liver indicators, including alanine transaminase (ALT), aspartate transaminase (AST), alkaline phosphatase (AKP), gamma-glutamyl transferase ( $\gamma$ -GT), total bile acids (TBA), total bilirubin (TB), and direct bilirubin (DB) at least two-fold increased. We converted fish oil lipid into 20% medium-chain triglycerides/long-chain triglycerides (MCT/LCT) lipids or soybean oil, MCT, olive oil, fish oil (SMOF) lipids after liver function improvement.

**Results:** After 10% fish oil lipid, the level of TBA, ALT, AST,  $\gamma$ -GT, TB, and DB significantly decreased ( $P<0.05$ ). The weight gain is more with use of 20% lipids than with 10% fish oil lipid (13.35 g/d vs 8.15 g/d,  $P=0.044$ ). After MCT/LCT lipids, all indicators had no significant changes compared to those before MCT/LCT lipids. However, after application of SMOF lipids, the levels of TB and DB statistically decreased ( $P<0.05$ ).

**Conclusion:** After the improvement of IFALD with fish oil lipid, SMOF lipids may be a good choice for sequential application of lipid emulsions on liver function in IF children, but large sample is still needed to prove it.

**Key words** lipid emulsion, children, IFALD, sequential application

Category: Clinical Nutrition

## **胆碱通过 SLC5A7 调控自噬来抑制肝细胞癌的进展并提高索拉非尼治疗效果**

## **Choline suppresses hepatocellular carcinoma progression and enhances sorafenib sensitivity via SLC5A7-mediated autophagy**

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**Background:** Hepatocellular carcinoma (HCC) is one of the leading causes of cancer-associated death. Although significant achievements have been made in the diagnosis and treatment of HCC, the prognosis of these patients remains unsatisfactory. One of the important reasons is therapeutic resistance. Emerging evidence suggests that autophagy plays a critical role in HCC tumorigenesis, metastasis, and drug resistance. Choline is an essential nutrient related to prolonged survival and reduced risk of HCC. However, it remains unclear whether this phenomenon is mediated by autophagy.

**Methods:** Two HCC cell lines (HUH-7 and Hep3B) were used in the present study. Cell growth was evaluated by cell counting kit 8 (CCK-8), colony formation, and in vivo mouse xenografts assays. Cell motility was calculated by wound healing and transwell assays. Autophagosomes were measured by Transmission Electron Microscopy (TEM), and autophagy flux was detected by mRFP-GFP- labeled LC3 protein. The mRNA level of genes was measured by quantitative real-time RT-PCR (qPCR). The protein levels were detected by Western blotting.

**Results:** We found that choline inhibited the proliferation, migration, and invasion of HCC cells by downregulating autophagy in vitro and in vivo. Upregulated expression of the solute carrier family 5 member 7 (SLC5A7), a specific choline transporter, correlated with better HCC prognosis. We further discovered that choline could promote SLC5A7 expression, upregulate cytoplasm p53 expression to impair the AMPK/mTOR pathway, and attenuate autophagy. Finally, we found that choline acted synergistically with sorafenib to attenuate HCC development in vitro and in vivo.

**Conclusions:** Our findings provide novel insights into choline-mediated autophagy in HCC, providing the foothold for its future application in HCC treatment.

**Key words** Hepatocellular carcinoma; Autophagy; Choline; SLC5A7; Sorafenib

# 基于胰岛素抵抗的慢性病营养管理研究进展

## Research progress of insulin resistance in nutrition management of chronic diseases

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**Background and objectives:** Insulin resistance (IR) is a pathological state in which target tissues fail to respond normally to insulin. At present, it is believed that IR is the common pathophysiological mechanism of metabolic syndrome. This article reviews the development process of related diseases and nutritional management caused by IR and understands the nutritional management models and characteristics of chronic diseases at home and abroad. The aim is to provide basis and guidance for better prevention and treatment of IR in the future and improve personalized and intelligent nutritional management for chronic disease patients.

**Methods:** Methods of document retrieval and content analysis were used to sort out and summarize the nutrition management related to IR of chronic diseases at home and abroad in this review.

**Results:** At present, there are many nutrition management methods for IR of chronic diseases and there are some differences in various management modes. However, the nutrition management is still not perfect. So it is necessary to develop personalized nutrition management measures based on personal diet and living habits to ensure the physical and mental health of patients, which will provide a new perspective to promote the development of nutrition and health. The effective nutritional management mode of chronic diseases is an important way to realize the control of chronic diseases.

**Conclusions:** In conclusion, we propose that tailored nutritional approaches should represent a promising approach for both the prevention and management of metabolic syndrome. In the future, artificial intelligence technology can be used to personalized manage chronic disease patients and improve their health levels. We need to strengthen interdisciplinary and cross regional exchanges to enhance the depth and breadth of research in this field.

**Key words** insulin resistance; nutrition management; chronic disease; metabolic syndrome; personalized nutritional approaches

## 2 型糖尿病患者的维生素 D 水平与心力衰竭风险：一项观察性和孟德尔随机研究

### Vitamin D Status and Risk of Heart Failure among Individuals with Type 2 Diabetes: Observational and Mendelian Randomization Studies

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**Objectives:** Recent studies have suggested that high intakes of vitamin D may not confer greater cardiovascular benefit than moderate intakes, but evidence is limited for heart failure (HF) outcomes and for people with type 2 diabetes (T2D), among whom vitamin D insufficiency or deficiency is particularly common. This study aimed to investigate the associations of serum 25-hydroxyvitamin D [25(OH)D] with HF risk among individuals with T2D, in observational and Mendelian randomization (MR) frameworks.

**Research Design and Methods:** Observational analyses were performed among 15,226 participants aged 37–73 with T2D from the UK Biobank. HF incidence was ascertained through electronic health records. Cox proportional hazard regression models were used to estimate hazard ratios (HRs) and 95% confidence intervals (CIs). MR analyses were conducted among 11,260 unrelated T2D patients. A weighted genetic risk score (GRS) for genetically predicted 25(OH)D concentration was instrumented using 62 confirmed genome-wide significant variants.

**Results:** The mean  $\pm$  standard deviation of serum 25(OH)D concentration was  $43.4 \pm 20.4$  nmol/L, and 65.7% participants had vitamin D less than 50 nmol/L. During a median follow-up of 11.1 years, 836 incident HF events occurred. Serum 25(OH)D was nonlinearly and inversely associated with HF and the decreasing risk tended to plateau at around 50 nmol/L. Comparing those with 25(OH)D  $<25$  nmol/L, the multivariable-adjusted HR (95% CI) for participants with 25(OH)D of 50.0–74.9 nmol/L was 0.66 (0.53, 0.82) and was similar for 25(OH)D  $>75$  nmol/L. In MR analysis, higher genetically predicted 25(OH)D was significantly associated with lower HF risk among people with T2D (HR: 0.64, 95% CI: 0.41, 0.99;  $P=0.047$ ).

**Conclusions:** Higher serum 25(OH)D was associated with lower HF risk among individuals with T2D and the MR analysis suggested a potential causal relationship. These findings indicate a potential role of maintaining adequate vitamin D status in the prevention of HF among individuals with T2D.

**Key words** Vitamin D; Heart Failure; Cohort study; Mendelian randomization

# 番茄红素对各种急性器官损伤的保护作用及其机制

## The protective effects and mechanisms of lycopene on various acute organ injuries

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Acute organ injury induced by various causes has become a challenging clinical event worldwide. Among its pathophysiologic mechanisms, the imbalanced oxidative stress and dys-regulated inflammatory response are considered to play crucial roles. Lycopene is a kind of fat-soluble non-provitamin A carotenoid which is found to be the most potent singlet oxygen quencher of C40 carotenoids (CARs). Owing to its powerful anti-inflammatory, antioxidant and apoptotic regulating abilities, lycopene has been proved to reduce the risk of chronic diseases such as cancer, cardiovascular diseases (CVD) and type 2 diabetes (T2DM). Furthermore, over the past decades, multiple evidence, especially results of in vivo or in vitro experiments, have shown the protective effects of lycopene against acute organ injuries, including lung, kidney, liver, myocardium, gastric, pancrea, spinal cord and brain. The underlying mechanisms may be scavenging reactive oxygen species (ROS), enhancing cellular antioxidant capacity, inhibiting the release of inflammatory factors, regulating expressions of apoptosis-related and autophagy-related proteins, attenuating mitochondrial damage and suppressing endoplasmic reticulum stress (ERS), involving the regulation of mitogen-activated protein kinases (MAPK), nuclear factor- $\kappa$ B (NF- $\kappa$ B), toll-like receptor 4 (TLR4), phosphatidylinositol 3-kinase/threonine kinase (PI3K/AKT), apoptosis and autophagy pathways. Through this review, we aim to investigate the effects of lycopene on various acute organ injuries, identify the possible mechanisms involved, and ultimately provide new insights for the treatment of acute organ injuries. Although there is still a lack of adverse event reporting, standardized dosages and standardized outcome indicators, the prospect of lycopene application in various acute organ injuries is promising.

**Key words** lycopene ; carotenoids ; phytonutrient ; clinical nutrition ; therapeutics

Category: Clinical Nutrition

# 营养诊断相关分组（DRGs）与人工智能背景下急诊患者的营养诊断：现状与展望

## Nutritional Diagnosis Related Groups (DRGs) and Nutritional Diagnosis of Emergency Patients in the Context of Artificial Intelligence: Current Status and Prospects

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Nutritional risk or malnutrition is prevalent in emergency patients and is associated with poor clinical outcomes. As populations age, the proportion of older people attending emergency departments is increasing, and the incidence of nutritional risk or malnutrition is higher. In 2016, the Global Leadership Initiative on Malnutrition proposed malnutrition diagnostic criteria that made nutrition diagnosis more precise among the disease diagnosis related groups in China. Since the "Healthy China 2030" was proposed, the nutritional status of patients has been paid more and more attention by medical workers. However, how to accurately and efficiently evaluate the nutritional status of emergency patients is still a problem for the majority of emergency medical workers. Therefore, based on GLIM standard and DRG, this paper reviews the nutritional risk screening, malnutrition diagnosis, clinical economic benefits and the future development direction of nutritional assessment of emergency patients in order to provide references for emergency medical staff to better understand the nutritional assessment of emergency patients.

**Key words** Emergency; Diagnosis related groups(DRG); Global Leadership Initiative on Malnutrition (GLIM); Machine learning; 5G communication technology

## 脆弱拟杆菌 839 预防乳腺癌患者化疗导致的骨髓抑制及胃肠道不良反应的随机对照研究

### A randomized trial of *Bacteroides fragilis* 839 on preventing chemotherapy-induced myelosuppression and gastrointestinal adverse effects in breast cancer patients.

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**Background:** In breast cancer patients, chemotherapy-induced myelosuppression and gastrointestinal reactions affect patients seriously. Several retrospective studies have evaluated the role of probiotics in preventing these adverse reactions, however, the effect of probiotics remain controversial.

**Objectives:** To determine the efficacy of *Bacteroides fragilis* 839 (Bf839) on the prevention of myelosuppression and gastrointestinal adverse effects in early breast cancer patients receiving adjuvant chemotherapy. **Methods:** 40 women with early breast cancer were randomly assigned to the Bf839 (n=20) or placebo (n=20) before the administration of adjuvant chemotherapy (4 cycles of epirubicin 100mg/m<sup>2</sup> and cyclophosphamide 600mg/m<sup>2</sup>). Myelosuppression and gastrointestinal adverse effects were monitored in both groups. **Results:** The incidence of myelosuppression in the BF839 group after chemotherapy was 52.94% versus 89.47% in the placebo group (RR=0.592, 95% CI: 0.368-0.950). Compared with baseline, the decrease of white blood cell counts in the BF839 group was  $0.22 \pm 1.13 \times 10^9/L$  versus  $1.33 \pm 0.62 \times 10^9/L$  in the placebo group, with a difference of  $1.11 \times 10^9/L$  (95% CI: 0.45-1.78; P=0.003). The neutrophil counts slightly increased in the BF839 group ( $0.14 \pm 1.11 \times 10^9/L$ ), while it decreased in the placebo group ( $1.02 \pm 0.71 \times 10^9/L$ ), with a difference of  $1.16 \times 10^9/L$  (95% CI: 0.48-1.84; P=0.002). But no difference was detected about the platelet and red cell counts in the two groups. Regarding gastrointestinal adverse effects, the incidence of grade 3/4 nausea was significantly lower in the BF839 group (52.94%) compared to the placebo group (89.47%), with an RR of 0.592 (95% CI: 0.368-0.950). The incidence of vomiting in the BF839 group was 29.41% versus 63.16% in the placebo group (RR=0.466, 95% CI 0.07-1.050), and the incidence of diarrhea in the BF839 group was 23.53% versus 42.1% in the placebo group (RR=0.559, 95% CI 0.204-1.528). **Conclusion:** In early breast cancer patients receiving chemotherapy, Bf839 have the potential to reduce the incidence of chemotherapy-related leukopenia/neutropenia and gastrointestinal side effects. The effect of BF389 on myelosuppression needs further validation in other malignancies.

**Key words** Breast cancer; chemotherapy; *Bacteroides fragilis* 839; Myelosuppression; Gastrointestinal adverse effects



Category: Clinical Nutrition

# **美国育龄妇女的碘状况:一项 NHANES 调查**

## **Iodine status among women of childbearing age in the United States: a NHANES survey**

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### **Abstract**

**Objective:** Iodine nutrition is an important public health issue. The aim of this study was to describe the trends in iodine status over time among US women of childbearing age and factors mediating changes of iodine status.

**Methods:** This cross-sectional survey involved 24,126 US women of childbearing age and the data were from National Health and Nutrition Examination Survey (NHANES) periods 2003–2008, 2009–2014, 2015–2020. We estimated trends of urine iodine in US women of childbearing age using linear regression analyses.

**Results:** From 2003–2008 to 2015–2020, urine iodine concentration (UIC) decreased from 143  $\mu\text{g/L}$  to 105  $\mu\text{g/L}$  ( $P$  trend < 0.001). Age was negative associated with UIC in women of childbearing age ( $P < 0.001$ ). Inadequate iodine intake was less frequent among non-Hispanic White and Hispanic compared to non-Hispanic Black in women of childbearing age. Women of childbearing age who "sometimes" and "often" consumed milk products were with higher UIC compared to those who "never or rarely" consumed milk products (0.15[0.08, 0.23] and 0.33[0.25, 0.42], respectively). Health insurance was positively associated with UIC ( $P < 0.001$ ). Education was negative associated with UIC in women of childbearing age ( $P < 0.001$ ).

**Conclusion:** Age, race, education, health insurance and the intake of milk products were significantly associated with iodine intake in women of childbearing age. Iodine deficiency (ID) in women of childbearing age remains a global public health concern.

**Key words** iodine; childbearing age; women; nutrition; NHANES.

Category: Clinical Nutrition

# **人工智能 + 膳食分析预测孕期重金属暴露风险**

## **Application of Machine Learning Algorithm in prediction of Heavy Metals Exposure Risk based on Dietary Data**

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**Objective** The objective of this study is to investigate the dietary intake and serum heavy metal levels of pregnant women in Shanghai, and analyze the correlation between them. The dietary data are also used to predict the risk of heavy metal exposure in pregnant women. **Methods** From January 2018 to January 2021, pregnant women were enrolled and given food frequency questionnaires. Serum heavy metal levels was detected by inductively coupled plasma mass spectrometry. Multiple linear regression and quantile regression were used to analyze the correlation between diet and serum heavy metals. Additionally, K-nearest Neighbor, Adaptive Boosting algorithm, and Back Propagation neural network were used to construct predictive models, which were evaluated using accuracy, sensitivity, and specificity. **Results** The study enrolled 501 pregnant women, and the average serum arsenic concentration was 0.87 ppb, cadmium concentration was 0.85 ppb, mercury concentration was 0.44 ppb, and lead concentration was 6.07 ppb. Multiple linear regression analysis showed that consuming ultra-processed foods, such as snacks, was related to an increase in serum arsenic ( $\beta = 0.441$ ,  $p = 0.015$ ), while consuming leafy vegetables was related to an increase in serum cadmium ( $\beta = 0.204$ ,  $p = 0.044$ ). Quantile regression analysis supported these results and showed an upward trend. Among the three algorithms used, the KNN model performed the best, with an accuracy of 84.58%, followed by the AdaBoost model (83.96%) and BP neural network model (79.98%). **Conclusion** In conclusion, in the low-level exposed population of pregnant women in Shanghai, consuming snack foods was associated with an increase in serum arsenic, while consuming leafy vegetables was associated with an increase in serum cadmium. The KNN model based on dietary data was the best in predicting heavy metal risk. **Acknowledgments:** This research was supported by Undergraduate Innovation Program of Shanghai Jiao Tong University School of Medicine (1521Z401)

**Key words** diet, serum heavy metals, artificial intelligence

## **n3 和 n6 多不饱和脂肪酸比例和心血管疾病高危人群心脏纤维化的相关性**

### **Ratio of serum n-3 to n-6 polyunsaturated fatty acids and cardiac fibrosis in patients with high risk of cardiovascular disease**

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**Background and Objectives:** Omega-3 polyunsaturated fatty acids (n-3 PUFAs), including eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), may decrease the risk of cardiovascular disease (CVD). In contrast, n-6 PUFAs, mainly arachidonic acid (AA), have a pro-inflammatory effect, which may increase the risk of CVD. This study evaluated the associations between EPA, DHA, AA, and their ratios (EPA/AA and DHA/AA) with the level of soluble suppression of tumorigenicity (sST2), a marker of cardiac fibrosis.

**Methods and Study Design:** Three hundred and thirty-one patients with a high risk of CVD were enrolled. The ultra-performance liquid chromatography-mass spectrometry method was used to detect the levels of serum n-3 PUFAs and n-6 PUFAs. In addition, the level of sST2 was determined by immunofluorescence assay.

**Results:** The median levels of EPA, DHA and AA were 0.54, 2.91, and 7.39  $\mu\text{mol/L}$  respectively. The levels of AA were positively correlated with DHA ( $r=0.79$ ,  $P<0.001$ ) and EPA ( $r=0.53$ ,  $P<0.001$ ). In multiple linear regression models, after adjusting for age, sex, smoking, hypertension, diabetes and history of coronary artery disease, the levels of AA and DHA, but not EPA, were positively associated with the levels of sST2. However, the ratio of EPA/AA was negatively related to the levels of sST2 (4th vs 1st quartile:  $\beta$ -value=-0.21, 95%CI=-0.34 to -0.09; or per 10% increment:  $\beta$ -value=-0.03, 95%CI=-0.05 to -0.01). No association between the ratio of DHA/AA and sST2 was observed.

**Conclusions:** The levels of AA may increase the risk of cardiac fibrosis, while the ratio of EPA/AA may play a protective effect, which was not observed in DHA/AA. Further studies are needed to explore whether increased dietary intake of EPA can lower the risk of cardiac fibrosis and heart failure.

**Key words** Cardiovascular disease, fibrosis, omega-3 PUFAs, omega-6 PUFAs, soluble ST2

Category: Clinical Nutrition

# 体重减轻对提高超重或肥胖多囊卵巢综合征妇女生育能力的有效性观察研究

## The effect of weight loss for improving fertility in overweight or obesity women with polycystic ovary syndrome

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**Objective:** To determine the effect of weight management on pregnancy rates in overweight/obese women with PCOS.

**Methods:** 135 overweight/obese women diagnosed with PCOS received a low-carbohydrate high-protein diet weight loss intervention for 0-3 months. The macronutrients was 30-40% of protein, 40-45% of fat, and 20-30% of carbohydrate. According to the tertile of weight loss and weight loss rate, they were divided into three groups: T1 (0.00kg, 4.70kg), T2 (4.71kg, 8.49kg), T3 (8.50kg, 28.7kg) and T1 (0.00%, 7.05%), T2 (7.06%, 12.70%), T3 (12.71%, 44.00%). Multivariate Logistic regression analysis was used to explore the influence of pre-intervention BMI and weight loss effect on the pregnancy rate of PCOS patients.

**Results:** Before the intervention, the average body weight of the women was  $77.07 \pm 10.51$ kg, and the BMI was  $30.36 \pm 3.63$ kg/m<sup>2</sup>. After 0-3 months of dietary intervention, the average weight loss rate is  $9.40 \pm 5.64\%$ , and the weight loss is  $7.26 \pm 4.67$ kg. A total of 80 cases (59.2%) were tested successfully conceived. Logistic regression analysis showed that compared with the pre-intervention BMI 24-28 kg/m<sup>2</sup> group, the OR (95%CI) values of successful pregnancy in the 29-32 and > 32 kg/m<sup>2</sup> groups were 0.79 (0.32, 1.95) and 0.38 (0.16, 0.92), respectively ( $P < 0.05$ ). Adjusting for age and pre-intervention BMI showed that compared with the lowest weight loss (T1) group, the OR (95%CI) values of successful conception in T2 and T3 groups were 2.14 (0.89, 5.12) and 1.35 (0.58, 3.17) respectively ( $P > 0.05$ ). Compared with the lowest weight loss rate (T1) group, the OR value and 95% CI of successful conception in T2 and T3 groups were 5.22 (2.01, 13.56) and 1.56 (0.68, 3.59) ( $P > 0.05$ ).

**Conclusion:** After 0-3 months of dietary intervention, a moderate range of weight loss rate can significantly improve the successful conception rate.

**Key words** Polycystic ovary syndrome, Weight loss, Dietary intervention, Female fertility, Reproductive health

## 商用三维光学身体扫描仪在测量中国超重和肥胖成年人人体成分中的适用性:基于减肥临床试验的二次分析

### The applicability of a commercial 3D0 body scanner in measuring body composition in Chinese Adults with overweight and obesity: a secondary analysis based on a weight-loss clinical trial

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**Background:** A commercial three-dimensional optical (3D0) scanning system was reported to be used in body composition assessment. However, the applicability in Chinese adults has not been well-studied.

**Methods:** This was a secondary analysis based on a 16-week weight-loss clinical trial with an optional extension to 24 weeks. Anthropometric indicators were measured by 3D0 scanning at each follow-up visit and bioelectrical impedance analysis (BIA) was also performed to confirm the reliability of 3D0 scanning. We used Lin's concordance correlation coefficients (CCC) to evaluate the correlation between two above-mentioned methods.

**Results:** 155 Chinese adults with overweight and obesity (47 men and 108 women, aged  $32.8 \pm 6.6$  years) were included in the analysis, which resulted 687 times of 3D0 measurements. The proportion of fat mass, fat mass, free-fat mass was  $34.0 \pm 5.3\%$ ,  $26.5 \pm 4.4$  kg, and  $49.8 \pm 9.6$  kg, respectively before the trial. And it was  $30.9 \pm 5.5\%$ ,  $22.4 \pm 5.8$  kg, and  $47.5 \pm 7.7$  kg after the trial. It was similar for the changes in waist and hip circumference. The differences between 3D0 scanning and BIA in free-fat mass, fat mass, and proportion of fat mass was 0.9 (-1.0, 2.7) kg, 1.3 (-0.5, 3.2) kg, and 1.8 (-0.6, 4.5) %, respectively. Compared with BIA, 3D0 scanning performed best in assessment of free-fat mass (CCC=0.92, 95%CI: 0.91, 0.93), then followed by fat mass (CCC=0.81, 95%CI: 0.79, 0.83) and proportion of fat mass (CCC=0.74, 95%CI: 0.71, 0.77). Subgroup analysis showed that 3D0 scanning and BIA correlated better in women than that in men, and correlated better in measuring free-fat mass in participants with larger body weight ( $BMI \geq 28.0$  kg/m<sup>2</sup>) than those with smaller body weight ( $<28.0$  kg/m<sup>2</sup>).

**Conclusions:** 3D0 scanning is a good tool to monitor changes in body composition in Chinese adults with overweight and obesity, however, data reliability is an important concern and the algorithm should be set accurately according to different ethnicity background.

**Key words** three-dimensional optical (3D0), bioelectrical impedance analysis (BIA), body composition

# 克罗恩病患者膳食营养素摄入评估及其与营养状况的关系

## Assessment of Dietary Nutrient Intake and its Relationship to the Nutritional Status of Patients with Crohn's disease

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**Background and Objectives:** To investigate the association between the dietary nutrient intake and nutritional status of patients with Crohn's disease (CD).  
**Methods and Study Design:** 60 CD patients who had been diagnosed but had not begun treatment were enrolled. The dietary nutrient intake was recorded after three days of 24-hour recall and was calculated using NCCW2006 software. The nutrition levels were assessed using the Patient-Generated Subjective Global Assessment (PG-SGA).  
**Indicators** included the BMI, mid-arm circumference, the circumference of the upper-arm muscle, triceps skinfold thickness, handgrip strength, and the circumference of the lower legs. **Results:** 85% of CD patients did not meet the necessary energy requirements. Of these, the protein and dietary fiber intake in 63.33%, and 100% respectively were below the standard of the Chinese dietary reference. Many patients had insufficient intake of vitamins, as well as other macro- and micronutrients. An inverse association was observed between the risk of malnutrition and higher levels of energy (1590.0–2070.6 kcal/d, OR=0.050, 95%CI=0.009–0.279) and protein (55.6–70.5g/d, OR=0.150, 95%CI=0.029–0.773). Appropriate supplementation of vitamin E, calcium, and other dietary nutrients helped to reduce the risk of malnutrition.  
**Conclusions:** Significant deficiencies in dietary nutrient intake were found in CD patients, and dietary intake was associated with the nutritional status of the patient. Appropriate adjustment and supplementation of nutrient intake may reduce malnutrition risk in CD patients. The gap between actual consumption and recommendation indicates a need for improved nutritional counseling and monitoring. Early relevant advice for the dietary guidance of CD patients may be beneficial for long-term effects associated with nutritional status.

**Key words** Crohn's disease • dietary intake • malnutrition • 24-hour recall • nutritional status

## 妊娠期母亲血糖状况和儿童血浆氨基酸水平的关联:来自多种族亚洲出生队列的发现

### Maternal Glycaemic Status during Pregnancy and Mid-Childhood Plasma Amino Acid Profiles: Findings from A Multi-Ethnic Asian Birth Cohort

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#### Background

Increasing maternal glycaemia across the continuum during pregnancy may predispose offspring to subsequent cardiometabolic risk later in life. However, evidence of long-term impacts of maternal glycaemic status on offspring amino acid (AA) profiles, which are emerging cardiometabolic biomarkers, is scarce. We aimed to investigate the association between maternal antenatal glycaemia and offspring mid-childhood AA profiles.

#### Methods

Data were drawn from the Growing Up in Singapore Towards healthy Outcomes (GUSTO) study, of which 422 mother-child dyads were followed from early pregnancy. Mothers underwent an oral glucose tolerance test (OGTT) at 26-28 weeks gestation, with fasting and two-hour plasma glucose concentrations measured, and gestational diabetes mellitus (GDM) was diagnosed per WHO 1999 guidelines. Offspring fasting plasma samples were collected at mean age 6.1 years, from which nine AAs were measured. Total branched-chain amino acids (BCAAs) were calculated as the sum of isoleucine, leucine, and valine concentrations. Multi-variable linear regression was used to estimate the association of maternal glycaemic status and offspring mid-childhood AA profiles.

#### Results

Approximately 20% of mothers were diagnosed with GDM. Increasing maternal fasting glucose was significantly associated with higher offspring plasma valine and total BCAAs, whereas higher two-hour glucose was significantly associated with higher histidine, isoleucine, valine, and total BCAAs, even after adjusting for child BMI z-scores. Offspring born to mothers with GDM had higher valine (standardised mean difference 0.27SD; 95%CI: 0.01, 0.52), leucine (0.28SD; 0.02, 0.53), and total BCAAs (0.26SD; 0.01, 0.52) than their counterparts.

#### Conclusions

Increasing maternal fasting and post-OGTT glucose concentrations during mid-late pregnancy were significantly associated with mid-childhood individual and total BCAAs concentrations. The findings suggest that higher maternal glycaemia across continuum in pregnancy, especially GDM, may have persistent programming effects on offspring AA metabolism underlying adverse cardiometabolic health.

**Key words** maternal glycaemia; amino acids; branched-chain amino acids; mid-childhood; gestational diabetes mellitus

# 血清维生素 D 水平在克罗恩病活动性评估中的作用以及联合检测维生素 D、身体质量指数和 TNF- $\alpha$ 对克罗恩病诊断和监测的预测价值

## Serum vitamin D levels in the assessment of Crohn's disease activity and the predictive value of joint detection of vitamin D, BMI, and TNF - $\alpha$ for the diagnosis and monitoring of Crohn's disease

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**Background:** Vitamin D (VD), especially its lack, plays a role in the progression and prognosis of Crohn's disease (CD). The study investigated the use of serum 25-hydroxyvitamin D (25[OH]D), body mass index (BMI) and tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ) in the diagnosis of Crohn's disease.

**Methods:** Seventy-six CD patients and healthy subjects were enrolled between May 2019 and December 2020. The serum 25(OH)D, BMI, and TNF- $\alpha$  levels, together with other biochemical parameters were assessed before treatment. The diagnostic efficacy of the single and joint detection of serum 25(OH)D, BMI, and TNF- $\alpha$  was determined using receiver operating characteristic (ROC) curves.

**Results:** The levels of 25(OH)D, BMI, and nutritional indicators including hemoglobin, total protein, albumin, and high-density lipoprotein cholesterol were lower in CD patients, while TNF- $\alpha$  levels were significantly higher. The areas under the ROC curve for the single detection of 25(OH)D, BMI, and TNF- $\alpha$ , were 0.887, 0.896, and 0.838, respectively, with optimal cutoff values of 20.64 ng/mL, 19.77 kg/m<sup>2</sup>, and 6.85 fmol/mL, respectively. The diagnostic efficacy of the joint detection of 25(OH)D, BMI, and TNF- $\alpha$  was highest, with an area under the ROC curve of 0.988 (95%CI 0.968~1.000).

**Conclusions:** Vitamin D deficiency, poor nutritional status, and high levels of inflammatory indicators were observed in CD patients. Vitamin D may be a potential interventional target in CD to improve nutritional status and reduce inflammation. The joint detection of 25(OH)D, TNF- $\alpha$ , and BMI showed high sensitivity, specificity, and accuracy in CD diagnosis and would thus be effective for the diagnosis of CD in clinical practice.

**Key words** vitamin D • Crohn's disease • BMI • TNF- $\alpha$  • Crohn's disease activity



# 循环瘦素水平对克罗恩病活动性的评估及其与营养状况的关系

## Circulating leptin levels in the assessment of Crohn's disease activity and its relation to nutritional status

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**Background:** Patients with Crohn's disease (CD) frequently experience malnutrition. Leptin is mainly synthesized by adipose tissue and regulates energy homeostasis. The objective of this study was to evaluate leptin levels and its relation to nutritional status in CD patients.

**Methods:** The study included 154 CD patients and healthy controls. Leptin level was determined before treatment. Nutrition levels were assessed using the nutrition risk screening 2002 (NRS-2002) and Patient-Generated Subjective Global Assessment (PG-SGA). Indicators included body mass index (BMI), mid-arm circumference, the circumference of the upper-arm muscle, triceps skinfold thickness, and circumference of legs.

**Results:** Leptin levels differed between CD patients ( $1025 \pm 874$  ng/ml) and controls ( $1848 \pm 222$  ng/ml). Significant differences were also seen in NRS-2002 and PG-SGA scores, BMI and other nutritional indicators. Negative correlations were observed between leptin and NRS-2002, PG-SGA scores, while positive correlations with other nutritional indicators. The ROC curve showed a strong association between leptin and the diagnosis of CD, suggesting a leptin concentration below 803.02 ng/ml as a threshold for CD. In the CD group, CDAI was negatively related to BMI, upper-arm circumference, and cholesterol, while positively associated with the NRS-2002 and PG-SGA scores.

**Conclusion:** Dysfunctional leptin regulation may account for the poor nutritional status associated with CD. Nutritional status was also correlated with disease activity. The leptin level is thus an additional useful tool for evaluating CD patients and predicting the disease activity and clinical response. Patients with plasma leptin levels below 803 ng/ml may be candidates for developing CD. This suggests that leptin may be a potential target for intervention in CD to improve nutritional status to slow disease progression.

**Key words** Crohn's disease • leptin • nutrition • Crohn's disease activity index • nutritional status

Category: Clinical Nutrition

# 少肌性肥胖对新冠肺炎合并慢性病老年患者预后的影响

## Prognostic role of sarcopenia obesity in elderly inpatients of COVID-19 combined with chronic disease

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**Background and Objectives:** The morbidity, incidence of complications, and mortality of COVID-19 in the elderly are high. This survey attempted to know prevalence of the nutritional status, sarcopenia, and other geriatric syndrome in elderly patients with COVID-19 in Shanghai, and analyze consequence of these situation on poor prognosis above due to COVID-19. **Methods and Study Design:** By review method, 113 elderly patients (73% male,  $89.6 \pm 7.0$  years old), whom admitted to chronic illness in a Shanghai hospital from July 2022 to December 2022, were chosen. All patients had test on comprehensive assessment after admission, including nutritional status, sarcopenia, frailty, daily living ability, cognitive psychology, etc. Demographic data, body composition, laboratory indicators, functional scores calculated for each geriatric syndrome were collected. Clinical prognostic indicators were recorded as discharge, or entering ICU to use ventilator, even death. The influence factors of poor prognosis were found using logistic regression. **Results:** Among 113 elderly patients, the prevalence of malnutrition was 4%, sarcopenia obesity was 35%, and depression was 19%. After corrected multivariate analysis, frailty (OR 17.8 [CI 1.4-227.8]), depression (OR 15.9 [CI 1.8-144.1]), and hemoglobin (OR 0.92 [CI 0.86-0.98]) were independent influencing factors of ventilator rate, while sarcopenia obesity (OR 4.7 [CI 1.2-19.9]) and hemoglobin (OR 0.93 [CI 0.88-0.97]) were independent influencing factors of death. **Conclusion:** Sarcopenia obesity in elderly inpatients had a high prevalence, and was a risk factor for all cause death of Covid-19, while hemoglobin, as a nutritional marker, was a protective factor of ventilator rate and mortality.

**Key words** sarcopenia obesity, hemoglobin, geriatric syndrome, ventilator rate, elderly inpatients

# 简易有氧和抗阻结合运动法对维持性血液透析肌肉减少症患者的效果研究

## Effects of a simple combined resistance-aerobic exercise approach on maintenance hemodialysis patients with sarcopenia

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**Objectives:** To test the effects of a simple combined resistance-aerobic exercise approach on maintenance hemodialysis (MHD) patients with sarcopenia.

**Methods:** Thirty MHD patients with sarcopenia in our hospital from March 2021 to December 2021 were randomly divided into control group (n=15) and intervention group (n=15). The intervention group received elastic belt resistance exercise training for 12 weeks, three times a week in interdialysis. Cycling aerobic exercise training was carried out during dialysis, while the control group was only given routine treatment without any exercise intervention. After 12 weeks of intervention, taking blood for biochemical examination before dialysis, inflammation, anthropometric indexes, human body composition by bioelectrical impedance, nutritional status by NRS2002, 7SGA and GNRI were collected, as well as their sleep quality and life quality. Independent sample T test, non-parametric test and Fisher's exact probability method were used to evaluate the equilibrium of baseline. For intra-group comparison, paired T test was used for normal distribution, and Wilcoxon test was used for non-normal distribution.  $P < 0.05$  is the difference with statistical significance.

**Results:** A total of 26 MHD patients with sarcopenia completed the trial. In patients in the intervention group (n=13), the hemoglobin (Hb) increased, MAC, MAMC, waist circumference, calf circumference and nutritional status were obviously improved than which in the control group (n=13), the serum creatinine and total cholesterol significantly decreased in the intervention group ( $P < 0.05$ ). However, there was no statistically significant difference in inflammation, most of body composition analysis index, sleep quality and most of life quality between the two groups ( $P > 0.05$ ).

**Conclusions:** The simple combined resistance-aerobic exercise approach was beneficial to increase HB level, improved nutritional status and reduced serum creatinine and blood lipid, but there was no significant improvement in inflammation index, body composition analysis index, life quality and sleep quality.

**Key words** Exercise; Sarcopenia; Maintenance hemodialysis; Nutrition

# 体质指数对髋膝关节置换术患者术后营养生化指标及住院时间的影响

## The Effects of Body Mass Index on Nutritional Biochemical Indexes and Length of Stay in Patients after Hip and Knee Replacement

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**Objective** To investigate the influence of body mass index (BMI) on nutritional biochemical indexes and length of stay in patients after hip and knee replacement. **Method** From January 2021 to May 2022, 214 patients who underwent hip and knee replacement in Department of Orthopedics were selected as the research objects. Based on BMI values, the patients were divided into four groups: dystrophy group (A group, BMI<18.50kg/m<sup>2</sup>)17 cases, normal body mass group (B group, BMI18.50–24.99kg/m<sup>2</sup>)67 cases, overweight group (C group, BMI25.00–29.99kg/m<sup>2</sup>)104 cases, obesity group (D group, BMI30.00–39.99kg/m<sup>2</sup>)26 cases. Nutritionists were determined to give nutritional intervention to patients 2 hours after they were awake from anesthesia. The differences of postoperative blood glucose, total protein, albumin, hemoglobin, postoperative hospital stay and total hospital stay in the four groups were observed. **Results** The blood glucose level of the normal body mass group and overweight group were lower than of the obesity group 1d after operation, the difference was statistically significant (P<0.05). The values of albumin and hemoglobin in the dystrophy group were lower than those in the normal body mass group, overweight group and obesity group 1d and 3d after operation, and the differences were statistically significant (P<0.05). The total protein value of dystrophy group and obesity group was higher than that of normal body mass group, and the difference was statistically significant (P<0.05). The postoperative hospital stay and total hospital stay in the normal body mass group and overweight group were lower than those in dystrophy group and obesity group, and the difference was statistically significant (P<0.05). **Conclusion** Body mass index (BMI) has certain influence on blood glucose, total protein, albumin, hemoglobin, postoperative hospital stay and total hospital stay in patients with hip and knee replacement.

**Key words** Body mass index, Hip and knee replacement, nutritional biochemical parameters, length of hospital stay.

# 血清蛋氨酸代谢物水平与肝细胞癌预后的关联：广东肝癌队列研究

## Serum methionine metabolites levels at Diagnosis and Hepatocellular Carcinoma Survival in the Guangdong Liver Cancer Cohort

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**Aim:** Methionine metabolism disorder can aggravate the damage in the pathological state of a disease, but its role in the prognosis of hepatocellular carcinoma (HCC) remains unclear. Therefore, this study aimed to evaluate the associations between serum methionine metabolites levels and HCC survival in a large prospective cohort.

**Methods:** We included 1080 newly diagnosed HCC patients from the Guangdong Liver Cancer Cohort enrolled between September 2013 and April 2017. Three core serum methionine metabolites including serum S-adenosylmethionine (SAM), S-adenosylhomocysteine (SAH), and homocysteine (Hcy) were measured by HPLC-MS/MS. Primary outcomes were liver cancer-specific survival (LCSS) and overall survival (OS).

**Results:** During a median follow-up of 1308 days, 601 deaths were identified, including 552 (92%) from HCC. In multivariable analyses, Higher serum Hcy, SAH and SAM levels were significantly associated with worse survival, independent of nonclinical and clinical prognostic factors including serum C-reactive protein, Barcelona Clinic Liver Cancer stage, and cancer treatment. The multivariate-adjusted HRs in the highest versus the lowest tertile of Hcy, SAH, and SAM were 1.29 (95% CI: 1.05–1.59,  $P$  trend = 0.016), 1.70 (95% CI: 1.36–2.14,  $P$  trend < 0.001), 1.41 (95% CI: 1.13–1.75,  $P$  trend = 0.002) for HCC-specific mortality and 1.28 (95% CI: 1.05–1.57,  $P$  trend = 0.015), 1.70 (95% CI: 1.37–2.11,  $P$  trend < 0.001), 1.40 (95% CI: 1.13–1.73,  $P$  trend = 0.001) for all-cause mortality. No overall association was observed between SAM/SAH ratio and LCSS or OS in the entire cohort. Restricted cubic spline analyses showed a dose-response associations between serum Hcy and SAH levels and worse OS (all  $P$  non-linearity < 0.05).

**Conclusion:** Higher serum Hcy, SAH and SAM levels were independently associated with worse survival in a population-based HCC cohort, suggesting that they may be used as a novel metabolism-related prognostic biomarker for HCC.

**Key words** Methionine metabolites; S-adenosylhomocysteine; S-adenosylmethionine; homocysteine; hepatocellular carcinoma; survival.

## 肾移植受者相位角、血清 25-羟基维生素 D 与其肌肉减少症的相关性研究

### Association of sarcopenia with 25-dihydroxyvitamin D and phase angle in kidney transplant recipients

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**Objectives:** To investigate the relationship between sarcopenia and 25-dihydroxyvitamin D or phase angle (PhA) in Kidney transplantation recipients (KTR). **Methods:** In this study, we investigated the prevalence of sarcopenia and the relationship between sarcopenia and 25-dihydroxyvitamin D or PhA, and evaluated the discrimination performance of these factors for sarcopenia in 82 kidney transplant recipients. Demographic information, body composition and blood biochemical indexes were collected in the Outpatient service. Sarcopenia was diagnosed by Asian Working Group for Sarcopenia (AWGS) 2019 consensus. Categorical variables were expressed as count and percentage, and continuous variables were expressed as mean  $\pm$  SD. Logistic regression models were used to estimate the ORs of the associations of 25-dihydroxyvitamin D or PhA with sarcopenia. The discrimination performance for sarcopenia was assessed by AUC-ROC. **Results:** A total of 82 KTR were enrolled in the study. The patients had a mean age of  $44.11 \pm 11.58$  years, 53 were males (65%). The sarcopenia group had low levels of weight, BMI, MAMC, waist circumference, hip circumference, left crus surrounds, right crus surrounds, handgrip strength, pinch strength, nutrition index, PhA and 25-dihydroxyvitamin D. 25-dihydroxyvitamin D (odds ratio (OR) 0.94, 95% confidence interval (CI) 0.89–0.993,  $p=0.026$ ) and PhA (OR 0.429, 95%CI 0.237–0.777,  $p=0.005$ ) were significantly associated with sarcopenia. The area under the bootstrap receiver-operating characteristic curve (AUC-ROC) was 0.747 for the combination of 25-dihydroxyvitamin D and PhA. **Conclusion:** 25-dihydroxyvitamin D and PhA were associated with the risk of sarcopenia and it can be used in clinical practice to predict sarcopenia in kidney transplant patients.

**Key words** Sarcopenia, 25-dihydroxyvitamin D, PhA, Kidney transplantation recipients

Category: Clinical Nutrition

# 维持性血液透析患者捏力及握力与肌肉质量的相关性研究

## Correlation study between pinch strength and hand grip strength and muscle mass in maintenance hemodialysis patients

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**Objective:** To investigate the correlation between PS and HGS and muscle mass in MHD patients. **Methods:** This was a cross-section and single center study. A total of 140 MHD patients treated during March 2021 in our center were enrolled in this study. Their PS and HGS were measured before dialysis. Multi-frequency body composition analyzer was used to measure the lean, body cell mass (BCM) and other body components, and the anthropometric data such as the height, weight, mid-arm muscle circumference and laboratory parameters before dialysis were collected. According to gender, clinical characteristics were compared between the two groups. Spearman or Pearson, multiple linear regression were utilized to analyze the correlation between the PS, HGS, muscle mass and laboratory parameters of MHD patients. **Results:** Compared with female patients, male patients had higher HGS, PS, lean, BCM, skeletal muscle mass (SMM) and predialysis serum creatinine, and had lower triceps skinfold thickness and interleukin -6 (IL-6), but had no significant differences in the dialysis vintage, serum albumin and body mass index. Multivariate regressive linear regression model showed that higher PS was independently correlated with higher serum creatinine, lean and BCM, and higher HGS was independently correlated with higher serum creatinine, lean and younger age ( $P < 0.05$ ). **Conclusion:** In MHD patients, HGS and PS were positively correlated with lean, BCM, SMM measured by bioelectrical impedance analysis. It can be seen that PS and HGS can be used as a good index to evaluate muscle function of MHD patients.

**Key words** Pinch strength; Handgrip strength; Muscle mass; Maintenance hemodialysis

# 血液微量元素与甲状腺结节合并代谢综合征的相关性研究

## Correlation between serum trace elements and thyroid nodules combined with metabolic syndrome

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**Background:** Previous studies have shown that the occurrence of thyroid nodules is strongly associated with metabolic syndrome, although the association between the occurrence of thyroid combined metabolic syndrome and detectable trace elements in the blood remains inconclusive. This study aimed to study the relationship between some trace elements and thyroid nodules combined with metabolic syndrome in iodine-sufficient areas of Dalian City, Liaoning Province, China.

**Methods:** The levels of 13 blood trace elements were determined using Inductively coupled plasma-Mass Spectrometry 2030 (ICP-MS 2030). All participants underwent thyroid ultrasound. The relationship between serum trace elements and thyroid nodules combined with metabolic syndrome was analyzed.

### Results:

(1) Comparative analysis of trace element differences between TN(+)/MS(+) group, TN(+)/MS(-) group, TN(-)/MS(-) group, the results showed that there were significant differences in zinc, copper, iron and magnesium content between the three groups.

(2) The serum trace element Zn was significantly positively correlated with TC and LDL-C; Serum trace element Cu was positively correlated with TC, LDL-C and HbA1c. Serum trace element Mg was significantly negatively correlated with BMI, SBP, DBP, FPG, TG, and HbA1c.

(3) Multivariate logistics regression analysis showed that the higher the Cu concentration, the higher the probability of patients being in the TN(+)/MS(+) group; The lower the Mg concentration, the higher the probability that the patient will be in the TN(+)/MS(+) group.

**Conclusion:** In the current study, the regression results showed that slightly higher concentrations of Mg had a protective effect on patients with thyroid nodule and metabolic syndrome. Therefore, this study provides a new idea for clinical intervention and supplementation of exogenous trace elements in the prevention and treatment of thyroid nodules and metabolic syndrome diseases. The observed association of Mg with thyroid nodules and metabolic syndrome populations warrants further study.

**Key words** Trace elements; thyroid nodules; metabolic syndrome; magnesium; cuprum



# 基于 CT 机体组成成分和炎症营养参数的评分系统预测急性粘连性小肠梗阻术后并发症的研究

## Nomogram of Combining CT-Based Body Composition Analyses and Inflammatory-nutritional score: Prediction of Postoperative complications in Acute Adhesive Small Bowel Obstruction Patients

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### Background

Based on computed tomography images, A nomogram combined with body composition and inflammatory-nutritional score was developed and validated to investigate the predictive value of postoperative complications in patients diagnosed as acute adhesive small bowel obstruction.

### Methods

A total of 189 acute adhesive small bowel obstruction patients at our hospital from January 2019 to February 2022 were retrospective enrolled and randomly divided in a ratio of 7:3 (n=132) into training and validation cohorts (n=57). Body composition was measured at the level of the third lumbar vertebra based on computed tomography images. Preoperative neutrophil-to-lymphocyte ratio and platelet-to-lymphocyte ratio were calculated by division of neutrophils and platelets by lymphocytes measured in peripheral blood. Nomogram was built using univariate and multivariate logistic regression analysis and assessed in the two cohorts.

### Results

In the multivariate analysis, skeletal muscle area, platelet-to-lymphocyte ratio, bowel ischemia, C-reactive protein levels, and American Society of Anesthesiologists score were independent risk factors for complications after surgery. The prognostic model had an area under the receive operating characteristic curve of 0.829 (95% CI, 0.747–0.910). The calibration curve showed good consistency between the predicted and observed outcomes. Decision curve analysis indicated that patients with acute adhesive small bowel obstruction can benefit from the prediction model.

### Conclusion

Our study developed and validated a CT based nomogram that incorporates body composition and inflammatory-nutritional score, which can be useful in prediction of complications preoperatively and guiding treatment decisions.

**Key words** body composition, inflammatory-nutritional score, acute small bowel obstruction, postoperative complications, prediction

# 中老年人奶制品摄入与握力的关联性研究：TCLSIH 队列 Association between Dairy Products Consumption and Muscle Strength in Middle Aged and Older Adults: The TCLSIH Cohort Study

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**Background:** Dairy products provide high quality protein and many other bioactive nutrients which is as an attractive candidate food for evaluation the potential role in promoting muscle health. Therefore, we performed this cross-sectional study to investigate the association of dairy consumption with handgrip strength in middle aged and older adults using data from the Tianjin Chronic Low-grade Systemic Inflammation and Health (TCLSIH) study.

**Methods:** We used data from 15,011 middle-aged and older adults in the TCLSIH study. Dairy products including milk, low-fat milk and yogurt consumption was assessed using a validated food frequency questionnaire. Handgrip strength was measured using a dynamometer. The relationships between dairy consumption (total dairy, milk, low-fat milk and yogurt) and handgrip strength were assessed using covariance analysis, adjusted for potential confounders.

**Results:** The mean consumption of total dairy, milk, low-fat milk, yogurt, and total dairy protein was 115.2 (112.1, 118.3) g/day, 56.7 (55.0, 58.4) g/day, 22.9 (21.7, 24.1) g/day, 35.7 (34.4, 37.0) g/day, and 3.67 (3.57, 3.77) g/day, respectively. After adjustment for multiple confounders, the least square means (95% confidence interval) for handgrip strength across total dairy consumption categories were 35.0 (34.8, 35.2) kg, 35.3 (35.1, 35.5) kg, 35.4 (35.2, 35.7) kg, and 35.6 (35.4, 35.7) kg (P for trend <0.001). In addition, the association between categories of milk and yogurt consumption and handgrip strength did not substantially change. However, we did not find significant relationship between categories of low-fat milk consumption and handgrip strength.

**Conclusion:** Higher consumption of total dairy, milk, and yogurt were positively associated with handgrip strength, while low-fat milk showed no association. Results imply the need for further study on the specialized effects of different dairy types on muscle health.

**Key words** handgrip strength; dairy products; milk; low-fat milk; yogurt

Category: Clinical Nutrition

# 低血糖生成指数的文献计量分析与可视化研究

## A bibliometric and visual analysis of low glycemic index

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**Objective:** To investigate the current status, hotspots and frontiers trends of low glycemic index (LGI) through bibliometric analysis.

**Methods:** We searched all research publications related to LGI from 2003 to 2022 on the Web of Scientific Core Collection (WoSCC). CiteSpace and VOSviewer software was used to analyze the cooperative relationships between countries, institutions, and authors, conduct co-occurrence analysis, cluster analysis, keyword burst analysis, and to analysis the co citation situation of cited journals and literature, and drawing a visual graph.

**Results:** A total of 5867 papers were included, with an increasing trend of annual publication. LCD categories mainly included Nutrition Dietetics, Food Science Technology and Endocrinology Metabolism which reflected the interdisciplinary characteristics. The United States was the largest research center of the whole world in the field of LGI. Universities were main research institutions and five of the top 10 institutions were from USA. American Journal of Clinical Nutrition was the leading journal. The hotspots of LCD are five aspects, “diabetes”, “glycemic index”, “glycemic load”, “diet”, “insulin”. We summarized that “irritable bowel syndrome”, “antioxidant property”, and “celiac disease” are becoming frontiers trends of LCD research in the future and deserve further study.

**Conclusions:** Over the past 20 years, research on LCD has received great attention. In order to explore LCD field better, multi-level mechanism research will be required in the future.

**Key words** Bibliometric analysis, low glycemic index, CiteSpace, VOSviewer, diabetes

Category: Clinical Nutrition

# **食物营养综合评价方法中关于标准选择问题的探讨**

## **Discussion about selection of standards in comprehensive evaluation of food nutrition**

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Objective: This paper makes research on the rationality of selection of standards in the comprehensive evaluation of food nutrition. Method: This paper studies the models of nutrient profile both at home and abroad, food nutrition labeling and other data used to evaluate the food nutrition. It introduces the selection of standards in the comprehensive evaluation of food nutrition. Results: People's demand for nutrients is influenced by food's nutrients, food intake and its frequency, ethnicity and others. For now, no well-recognized golden standard is applied to the nutrient profile, and no unified standard can be used to evaluate the nutrition of food. There is no best method for the evaluation process. Conclusion: No existing standards used for the evaluation of food nutrition is fully scientific or rational. Their accuracy and evaluation results need further research.

**Key words** food; standard; nutrient profile; nutritional evaluation; Food Labeling

Category: Clinical Nutrition

## 孕妇维生素 D 缺乏对子代健康的影响

# Impacts of vitamin D deficiency in pregnant women on their children

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Vitamin D deficiency is a common problem worldwide, especially in pregnant women. Vitamin D is very important for the health of Pregnant women and plays a key role in growth and metabolism for children. It is not only regulates calcium and phosphorus metabolism and maintains plasma calcium and phosphorus levels, but also plays an important role in regulating immunity and preventing metabolic syndrome. The level of 25(OH)D in pregnant women is closely correlated to that in fetus blood circulation (umbilical cord blood). When severe vitamin D deficiency occurs in pregnant women, their fetuses in the uterus begin to lack vitamin D. In China, since some pregnant women and doctors worry that long-term vitamin D supplementation may lead to poisoning, many pregnant women do not timely and adequately receive vitamin D supplements. So it is necessary to monitor and supplement vitamin D for prevention and treatment of vitamin D deficiency in pregnant women. This article reviews studies on vitamin D deficiency and supplementation in pregnant women.

**Key words** Vitamin D deficiency; Pregnant; Calcium and phosphorus metabolism; Liposoluble vitamins; Children

# 肌肉衰减症的诊断和治疗相关进展：关于指导性文件的系统综述

## Advances in diagnosis and management of sarcopenia: a systematic review of guidance documents

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### Abstract

**Background and Objectives:** Multiple organizations have published a variety of guidance documents to offer recommendations that can implement in clinical practice and/or research. We aimed to appraise the methodological quality of included documents, and synthesize available recommendations for the screening, diagnosis and management of sarcopenia based on them.

**Methods:** We searched electronic database, guideline database, guideline organizations and professional societies websites for clinical practices, consensus statements and position papers in terms of sarcopenia, muscle atrophy or muscle loss from their inception date to April 2023. We screened relevant reviews and studies of all references as well to identify other relevant citations. The Appraisal of Guidelines for Research and Evaluation II (AGREE II) instrument was used to assess the methodological quality.

**Results:** Thirty-seven guidance documents published between 2010 and 2023 were included. Included documents performed well in the domains of Clarity of Presentation (median 80%, IQR 18) and Scope and Purpose (median 78%, IQR 16). Only 4 (11%) of the documents fulfilled  $\geq 50\%$  of all the AGREE II domains. Screening for sarcopenia is recommended by numerous documents and SARC-F was the most recommended tool. Muscle function is the core of the three-level diagnosis of sarcopenia. The management strategy for both age-related and disease-related sarcopenia mainly focused on exercise and nutrition intervention. In addition, the documents also emphasize the importance and significance of a multidisciplinary team to engage in the full-life cycle management of sarcopenia.

**Conclusion:** Guidance documents available on the diagnosis and management of sarcopenia has advanced referential recommendations that have guiding significance. But the inconsistency in recommendations and variation in methodological rigour suggests that high-quality evidence for guidance document development is lacking yet.

**Key words** Sarcopenia, diagnosis, management, guidance, AGREE II, systematic review

# 磷脂是肝细胞癌组织生物标志物的潜在重要来源：涉及靶向代谢组学的前瞻性队列研究结果

## Phospholipids are potentially important source of tissue biomarkers for hepatocellular carcinoma: results of a prospective cohort study involving targeted metabolomics

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**Background and Objectives:** Previous studies have indicated that hepatocellular carcinoma (HCC) is linked to abnormal phospholipid metabolism. However, comprehensive analysis of phospholipids for HCC is very limited, especially in the tissue level. Herein, we sought to compare phospholipids between in tumor and normal tissue adjacent to the tumor and to identify the risk of cancer-related death in HCC patients.

### Methods and Study Design

Quantitative comprehensive phospholipidomic analysis was performed using hydrophilic liquid chromatography-electrospray ionization-triquadrapole-mass spectrometry (HILIC-ESI-MS/MS), allowed for comparison of 266 different lipids between paired tumor and adjacent tissue cancer tissue from HCC patients in a prospective cohort (n = 87). Differential metabolites were identified by paired t tests and orthogonal partial least-squares discriminant analysis (OPLS-DA). We assessed the risk predictivity of metabolites using multivariable cox regression models.

### Results

Significant differences were found in 58 lipid compounds between the two types of tissue. PC(30:0), lysoPE (22:2) and SM(d38:0) represent notable biomarkers that differentiate HCC from nondiseased tissue, and lysoPG species are depleted in the tumor tissue of HCC patients. A combination of 5 metabolites of independent effects showed the potential to predict HCC prognosis, with an AUC of 0.992 (95% CI: 0.978-1). Regarding prognosis, PC(30:1), PE(32:1) and SM(d38:0) in tumor, lysoPC (20:1) and total lysoPG in normal tissue may predict HCC mortality and constitute important biomarkers in the multivariate analysis.

### Conclusions

Our study reveals that phospholipids play a crucial role in tumor and normal tissue, and represent a robust lipid signature with prognostic potential. A better understanding of the cancer-associated glycerolipid and sphingolipid metabolism may lead to novel therapeutic strategies.

**Key words** hepatocellular carcinoma; metabolomics; phospholipids; prognosis; liquid chromatography-mass spectrometry

## 联合补充鱼油与维生素 D3 对非酒精性脂肪肝患者肠道菌群和粪便代谢物的影响:随机对照试验

### Supplementation with fish oil plus vitamin D<sub>3</sub> on gut microbiota and fecal metabolites in non-alcoholic fatty liver disease subjects: a randomized controlled trial

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Qingdao University

The present study aimed to investigate the effects of fish oil plus vitamin D<sub>3</sub> (FO + D) on gut microbiota and fecal metabolites in nonalcoholic fatty liver disease (NAFLD) subjects. A total of 61 subjects were randomly divided into three groups: FO + D group (2.34 g/day of eicosatetraenoic acid (EPA) + docosahexaenoic acid (DHA) + 1680 IU vitamin D<sub>3</sub>), FO group (2.34 g/day of EPA + DHA), and CO group (1.70g/d linoleic acid). Supplementation with FO + D was associated with significantly increased the relative abundance of *Alistipes* and 1,25-dihydroxyvitamin D<sub>3</sub> levels, compared with FO group. The relative abundances of *Eubacterium* were significantly increased whereas 8,9-DiHETrE levels were significantly decreased in the FO + D group, compared with CO group. Correlation analyses showed that changes of 1,25-dihydroxyvitamin D<sub>3</sub> levels were inversely correlated with HOMA-IR levels, while 8,9-DiHETrE levels were positively associated with adiponectin levels. This study demonstrated that FO + D supplementation could regulate gut microbiota and fecal metabolomic profiles through which mediated glucolipid metabolism and chronic inflammation to alleviate NAFLD.

**Key words** Non-alcoholic fatty liver disease; Gut microbiota; Fecal metabolomics; Fish oil; Vitamin D<sub>3</sub>; Randomized controlled trial.



# 饮食营养干预对肥胖儿童肠道菌群的影响

## Changes of Gut Microbiota in Children with Obesity Participating in Diet-Based Nutritional Intervention

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**Background:** Gut microbiota plays a key role in the development of obesity in children. However, there has been limited research on changes of gut microbiota in obese children before and after weight loss. This study profiled and compared gut microbiota composition of obese children before and after diet-based nutritional intervention.

**Methods:** 30 obese children received nutritional intervention for 12 weeks. Their body composition was measured using bioelectrical impedance (Inbody S10) and fecal samples were collected at 0, 12 weeks. Fecal samples from 48 normal-weight children were also collected as control group. The gut microbiota was profiled with 16S amplicon sequencing.

**Results:** Over the intervention of 12 weeks, obese children experienced a significantly decrease in body weight, BMI, BMI z-score and body fat ( $p < 0.001$ , all). The alpha and beta diversity of gut microbiota indicate that dietary intervention significantly affect the composition, richness and structure of microbiota in obese children than obese children without treatment and control group. After nutritional intervention (NTA group), compared with before intervention (NTB group) and the control group, the relative abundance of Actinobacteria and Actinobacteriota increased significantly ( $P < 0.001$ , all), while Bacteroides decreased significantly ( $P < 0.001$ , all). At the genus level, compared to the Control and NTB group, the NTA group had significantly higher relative abundance of Bifidobacterium, Collinsella, Streptococcus, Blautia and Escherichia-Shigella ( $P < 0.05$ , all) and had lower relative abundance of Bacteroides and Megamonas ( $P < 0.001$ , both). At the functional level, carbohydrate and nucleotide metabolism were increased and lipid, energy and amino acid metabolism were decreased in the NTA group than the Control and NTB groups.

**Conclusions:** The gut microbiota of obese children showed characteristic changes with Bifidobacterium as the dominant bacteria after nutritional intervention. The altering of gut microbiota by diet-based nutritional interventions could be a promising strategy to help control childhood obesity.

**Key words** child; gut microbiota; obesity; nutritional intervention

Category: Clinical Nutrition

## 短双歧杆菌 207-1 对改善健康成人的心理健康和睡眠的影响：一项随机、双盲、安慰剂对照试验

### Effects of *Bifidobacterium breve* 207-1 on Improving Mental Health and Sleep in Healthy Adults: A Randomized, Double-Blind, Placebo-Controlled Trial

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Gut microbiota and mental health are closely related. Our study aims to explore the efficacy and safety of *Bifidobacterium breve* 207-1 in improving stress-related symptoms (e.g., anxiety, depression, insomnia) in healthy adults. A total of 120 healthy adults with subclinical symptoms of high mental stress, overweight, insomnia and constipation were retrospectively registered and were randomly assigned to receive low dose 207-1 (LD,  $n = 40$ ) or high dose 207-1 (HD,  $n = 40$ ) or placebo (PL,  $n = 40$ ) for 28 days. Fecal and blood were collected from the participants before and after the trial. Participants were also asked to take medical examinations and complete the Pittsburgh Sleep Quality Index (PSQI), the Self-Rating Depression Scale (SDS), and the Self-Rating Anxiety Scale (SAS) before and after the intervention. The results showed that 207-1 stimulated the proliferation of neurotransmitters such as 5-HT and GABA, and inhibited HPA axis hyperactivity. The PSQI scores in the HD group decreased significantly which represented improved sleep quality. In addition, the gut microbiota has changed under the intervention of 207-1. There was a significant increase in *B. breve* in the LD and HD groups ( $P < 0.05$ ). The relative abundance in the control group of *Eggerthelia*, *Desulfovibrio* and *Desulfobacterota* were significantly higher than the probiotics groups ( $P < 0.05$ ). And the relative abundance of *Ruminococcus* in the LD group significantly decreased while SCFAs increased, especially acetic acid and propionic acid ( $P < 0.05$ ). In conclusion, *B. breve* 207-1 alleviates mental stress and sleep problems in healthy adults by directly affecting neurotransmitters and hormones, as well as indirectly by regulating the composition of gut microbiota and promoting SCFAs synthesis. Probiotics have some potential efficacy in regulating mental health and therefore are expected to be a new therapeutic target for mental illness.

**Key words** *Bifidobacterium*, gut microbiota, 5-HT, GABA, HPA axis, SCFAs

Category: Clinical Nutrition

## 2 型糖尿病综合治疗中营养干预的 meta 分析

# A meta-analysis of medical nutrition interventions in the comprehensive treatment of type 2 diabetes mellitus

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**Abstract:** **Objective** The aim of this study was to evaluate the effectiveness of different existing interventions in the management of type 2 diabetes mellitus in the comprehensive treatment by using meta-analysis method by evaluating the existing interventions in the domestic literature at this stage. **Methods** Various mainstream electronic resource databases were searched, including: CBM, Wanfang database and CNKI, for original literature that met the objectives of the study. Literature inclusion and exclusion criteria were developed for literature screening. The Cochrane systematic evaluation method was used to conduct meta-analysis of the included literature. **Results** There were statistically significant differences between modified medical nutrition therapy and conventional medical nutrition therapy in terms of FPG, 2hPG, HbA1c, TC, TG, and BMI, and the study effects were more favorable to the intervention group. **Conclusion** The results of the analysis showed that the final effect of the interventions on the group of patients with type 2 diabetes mellitus by using new measures such as nutritional behavioral interventions, low GI dietary mix, nutrient energy adjustment, dietary structure improvement, nutritional health education, individualized nutritional therapy and medicinal food, based on the traditional medical nutrition therapy, was more significant in terms of FPG (fasting blood glucose), 2hPG (2 h postprandial blood glucose), HbA1c (glycated hemoglobin), TC (blood glucose), and BMI. The final effect was more significant in FPG (fasting glucose), 2hPG (2h postprandial glucose), HbA1c (glycosylated hemoglobin), TC (total serum cholesterol), TG (triglycerides), and BMI (body mass index) than the traditional model, which had a significant positive impact on the treatment of type 2 diabetes, effectively lowering the patients' blood glucose and correcting their metabolic disorders, thus improving their quality of life. The modified medical nutrition therapy has a more significant positive impact on the control of type 2 diabetes and has clinical promotion significance.

**Key words** Type 2 diabetes mellitus nutritional intervention nutritional therapy

## 猪皮胶原低聚肽通过 PHD-HIF1 $\alpha$ 途径保护 DSS 诱导的小鼠溃疡性结肠炎的作用及其机制

### Effect and mechanism of collagen oligopeptides from porcine skin protecting DSS-induced ulcerative colitis in mice via PHD-HIF1 $\alpha$ pathway

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Collagen oligopeptides are a typical small molecule peptide compound with various biological activities. Pork skin is a good source of collagen peptides, but its application in dietary therapy has only recently been explored. In present study, the intestinal protective effects of pork skin collagen oligopeptides (CH) were examined in DSS-induced colitis in C57BL/6 mice and H2O2-induced human intestinal epithelial Caco-2 cells, respectively. CH could effectively alleviate the weight loss, diarrhea, rectal bleeding, colon shortening and other colitis symptoms and histopathology changes of the colitis mice. CH protected intestinal barrier function of colitis mice by maintaining the key tight junction proteins of colon, such as ZO-1, Occludin, and Claudin-4, inhibiting pro-inflammatory cytokines and myeloperoxidase activity, and enhancing peripheral blood white blood cells and lymphocytes. CH could promote HIF-1 $\alpha$  Hydroxylation decomposition by promoting the expression of PHD. In oxidative damage model of Caco-2 cells induced by H2O2, CH reduced intracellular reactive oxygen species production, plasma membrane damage, and cell apoptosis induced by increasing the expression of tight junction proteins (ZO-1, Occludin, and Claudin-4). Overall, our research results indicated that CH exerted anti-colitis efficacy via inhibiting intestinal hypoxia and exerting anti-oxidative and anti-inflammatory effects.

**Key words** collagen oligopeptides, colitis, inflammatory, tight junction protein, HIF-1 $\alpha$  ; PHD

# 极低能量脂肪膳食治疗孕期罕见高脂血症

## Treatment of Rare Hyperlipidemia in Pregnancy with Extremely Low-Fat and Low-Energy Diet----a Case Report

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Hyperlipidemia is one of the causes of acute pancreatitis (AP), a condition which is potentially more dangerous during pregnancy. Until now, there are not any specific diagnostic criteria and management protocols for this condition which complicates pregnancy.

**Objective:** Report the therapy progress and effect of extremely low-fat and low-energy diet for a rare hyperlipidemia during pregnancy.

**Method:** Use diet which offer energy range from 1190.7kcal/d to 1460 kcal/d(reached 60% of the minimum requirement for a pregnant woman) and fat range from 5g/d to 20g/d to treat a rare hyperlipidemia during pregnancy. The patient had a history of four episodes of acute pancreatitis, three of them occurring in pregnancy and induced adverse obstetrical outcomes. Genetic testing were conducted.

**Outcome:** The pregnant women's triglycerides were decreased from 19.37 mmol/L to 5.6 mmol/L, total cholesterol were decreased from 7.57 mmol/L to normal range. There was no intrauterine growth retardation during the entire pregnancy and the patient delivered a healthy baby weighing 2,500g with Apgar scores of 9 and 9 at 1 and 5 minutes.

Genetic testing detected a likely pathogenic mutation(GPIHBP1;NM\_178172.3;c.48\_49insGCGG;p.Pro17Alafs\*22;EX1;Hom). It is may related to chylomicronemia.

**Conclusion:** Diet with energy reached 60% of the minimum requirement for a pregnant

woman, and adequate protein, very low fat but enough DHA and EPA may help pregnant women with chylomicronemia to decrease blood fat and won't induce intrauterine growth retardation.

**Key words** Low-Fat and Low-Energy; Hyperlipidemia; Acute pancreatitis; Diet management; Pregnant.

# 纤维蛋白原与清蛋白比值指数对胃间质瘤危险程度分级的预测价值

## Predictive value of fibrinogen-to-albumin ratio index for risk classification of gastric stromal tumor

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**Objective** To investigate the value of fibrinogen-to-albumin ratio index (FARI) in predicting the risk classification of gastric stromal tumor. **Methods** A total of 208 patients with gastric stromal tumor diagnosed by postoperative pathology and immunohistochemistry after surgical or endoscopic resection were collected retrospectively. According to postoperative pathology, the patients were divided into low risk group and high risk group, and the relationship between preoperative clinical data and the risk of gastric stromal tumor was analyzed. **Results** Single factor analysis showed that the differences of clinical symptoms, neutral points leaf nuclear count, platelet count, NLR, PLR, albumin, fibrinogen, FARI, triglyceride, high-density lipoprotein cholesterol, tumor cell morphology, fission like counting, tumor size had statistical significance ( $P < 0.05$ ) between the two groups. Logistic regression analysis showed that  $FARI[OR=1.18; 95\%CI (1.03, 1.35); P<0.05]$  and  $HDL-C[OR=0.18; 95\%CI (0.09, 0.33); P<0.01]$  were independent risk factors for the risk degree of gastric stromal tumor. The ROC curve analysis showed that when the area under the FARI curve was 0.711 and the optimal threshold value was 7.86%, the sensitivity and specificity for predicting the risk of gastric stromal tumor were 0.551 and 0.806. **Conclusion** FARI can be used as an independent predictor of the risk degree of gastric stromal tumors, and has a certain guiding significance in the early prediction of risk classification and prognosis prediction.

**Key words** gastric stromal tumor; fibrinogen-to-albumin ratio index; risk classification

# 摄入全脂牛奶不增加冠心病患者心血管及代谢风险：一项多中心前瞻性随机对照研究

## Daily full-fat milk intake does not increase cardiometabolic risks in patients with coronary artery disease: a multi-center randomized controlled trial

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6. Inner Mongolia Yili Industrial Group, Co. Ltd., Yili Maternal and Infant Nutrition Institute Aims

This randomized controlled trial aims to verify what effect full-fat milk intake has on cardiovascular health in patients with coronary artery disease (CAD).

### Methods

Patients diagnosed with CAD were enrolled from 2020–2021 and randomized to four groups: (A) skim milk, (B) full-fat milk from corn-fed cows, (C) full-fat milk from grass-fed cows, and (D) placebo according to milk components. Daily intake of 500ml milk was continued for 12 weeks in trial groups and no milk or other dairy products was taken in the placebo group. All patients had blood tests for glucose, lipids profile and biochemical parameters before and after milk intake. Cardiac MR scan was performed to observe heart geometry and straining change over the 12-week period.

### Results

A total of 160 patients were enrolled and completed the study, with average age of 66 and 65 % male. No death or myocardial infarction happened in four groups. There was no significant difference in biochemical and lipid profile among four groups after 12-week full-fat milk, or skim milk or no dairy intake at all. Full-fat milk did not increase triglycerine, total cholesterol, LDL-C, Lp(a), or Apo(B) levels. Significant reduction of fasting glucose was found only in patients taking full-fat milk from grass-fed cows ( $-0.73\text{mmol/l}$ ,  $P<0.01$ ). Cardiac MR scan suggested that the left ventricular geometry and function remained unchanged, which was comparable to the skim milk or placebo controls. Nevertheless, favorable LV straining change was observed (increased LV radial strain rate) in patients taking full-fat milk from grass-fed cows.

### Conclusions

Diet containing a moderate portion of full-fat milk neither increases blood lipid and metabolic burden, nor jeopardizes heart function in cardiovascular patients. Moreover, full-fat milk from grass-fed cows may even lower blood glucose level and improve myocardial vitality, possibly by enhancing insulin sensitivity, and therefore benefit cardiovascular health, which is unseen in skim milk.

**Key words** full-fat milk, coronary artery disease, cardiometabolic risks

# 中国 GLIM 标准对造血干细胞移植患者营养不良诊断的影响

## The influence of the China GLIM standards on the diagnosis of malnutrition in patients with hematopoietic stem cell transplant

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**Background:** Muscle-related indicator is removed from Global Leadership Initiative on Malnutrition (GLIM) criteria implemented in China. This article aims to explore the role of muscle mass in the diagnostic criteria of malnutrition and the effects of GLIM-China for diagnosing malnutrition.

**Methods:** A total of 98 inpatients with hematopoietic stem cell transplants (HSCT) were recruited. Nutrition risk was assessed by using the Nutritional Risk Screening 2002 (NRS-2002). Appendicular skeletal muscle mass (ASMI) and fat-free mass index (FFMI) were determined using the bioelectrical impedance analysis (BIA) method. Malnutrition is defined by GLIM-China, GLIM, and PG-SGA. We use erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) to assess inflammation in GLIM and GLIM-China. The correlation or consistency among ASMI, FFMI, ESR, CRP, GLIM-China, GLIM, and PG-SGA was evaluated, respectively.

**Results:** All the patients had nutritional risk. The magnitude of malnutrition using PG-SGA, GLIM, and GLIM-China was 75.5, 80.6, and 64.3%, respectively. GLIM-China and PG-SGA showed the same performance ( $p = 0.052$  vs.  $1.00$ ) and agreement ( $\kappa = 0.404$  vs.  $0.433$ ,  $p < 0.0001$ ) with FFMI. Consistency was noted between ASMI and PG-SGA in the assessment of malnutrition ( $p = 0.664$ ) with a good agreement ( $\kappa = 0.562$ ,  $p = 0.084$ ). ASMI and FFMI could determine muscle mass reduction, which could not be determined by BMI, albumin (ALB), and pre-albumin (pre-ALB); 34% of GLIM-China (-) patients were with low ASMI, and 40% with low FFMI; 30.0% of patients with PG-SGA ( $<4$ ) still have low ASMI, and 38.2% have low FFMI.

**Conclusion:** If only the PG-SGA scale is used as a diagnostic criterion for evaluating malnutrition, a large proportion of patients with reduced muscle mass will be missed, but more patients with muscle loss will be missed via GLIM-China. Muscle-related indicators will help diagnose malnutrition.

**Key words** Muscle mass, HSCT, Malnutrition, GLIM-China, PG-SGA



# 严重烧伤患者的肠内谷氨酰胺补充：系统评价和 meta 分析的更新

## Enteral Glutamine Supplements for Patients with Severe Burns: Update of Systematic Review and Meta-analysis

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**Background and Objectives:** Our previous study in 2009 concluded that glutamine may shorten the length of hospital stay (LOS) in patients with severe burns. Recent large-scale studies have suggested a decline in the effectiveness of glutamine in treating patients with severe burns over the last decade. Therefore, we conducted this systematic review and meta-analysis to update the status of glutamine uses in patients with severe burns.

**Methods and Study Design:** We retrieved related literature prior to December 2022 using the PubMed, Web of Science, Cochrane Library, Embase, SinoMed, Wanfang, and China National Knowledge Infrastructure (CNKI) databases. Data from studies that compared enteral glutamine for severe burns with a control group were extracted, pooled, and analyzed.

**Results:** Six randomized controlled trials involving 1,398 patients were included in the analysis. There were no significant differences in overall mortality (risk ratio [RR] =0.37; 95%confidence interval [CI], [0.06, 2.37]; P=0.30) or infectious morbidities (RR=0.73; 95%CI, [0.41, 1.31]; P=0.29). The incidence of MODS was similar between the two groups (RR=0.27; 95% CI, [0.03, 2.24]; P=0.22). The LOS (mean difference [MD] =-8.97; 95%CI, [-15.22, -2.71]; P=0.005) and LOS/total burn surface area (TBSA) (MD=-0.27; 95%CI, [-0.54, -0.00]; P=0.05) decreased in the enteral glutamine group. The incidence of wound infection was significantly reduced (RR=0.42; 95% CI, [0.16, 1.06]; P=0.07).

**Conclusions:** Compared to the control group, enteral glutamine administration may not improve the mortality, although it may be associated with a shorter LOS, a lower LOS/TBSA ratio, and may reduce the risk of wound infection in patients with severe burns.

**Key words** glutamine, enteral, severe illness, burn, mortality, infection

# **ω-3 脂肪酸对住院的 COVID-19 患者的疗效：一项纳入随机对照试验的系统评价和 meta 分析**

## **Efficacy of omega-3 fatty acids for hospitalized COVID-19 patients: a systematic review and meta-analysis of randomized controlled trials**

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Sichuan Academy of Medical Science, Sichuan Provincial People's Hospital

**Background and Objectives:** Emerging expert consensus and guidelines recommend that omega-3 fatty acids may have anti-inflammatory effects in hospitalized patients with coronavirus disease (COVID-19). However, these recommendations are based on pathophysiological studies of inflammation rather than direct clinical evidence. We conducted this systematic review and meta-analysis to evaluate the efficacy of omega-3 fatty acid supplementation in hospitalized patients with COVID-19.

**Methods and Study Design:** We retrieved literature from PubMed, Web of Science, Embase, China National Knowledge Infrastructure (CNKI), WANFANG, Chinese Biomedical Literature Database, and Cochrane Library databases up to April 10, 2023. Data from studies comparing omega-3 fatty acids with a placebo or other pharmaceutical nutrients were analyzed.

**Results:** Of the 3032 records, 42 full-text articles were reviewed, five eligible studies were identified, and one study was found in the references. Six studies involving 273 patients were included, pooled, and analyzed. Compared to the control group, omega-3 fatty acid intervention reduced the overall mortality of hospitalized patients with COVID-19 (RR=0.76; 95% CI, [0.61, 0.93]; P=0.010). No serious or unexpected drug-related adverse events were observed. No statistical significance was observed in the levels of inflammatory markers such as CRP (MD=-9.69; 95% CI, [-22.52, 3.15]; P=0.14; I<sup>2</sup>=97%) and IL-6; however, the neutrophil/lymphocyte ratio was significantly lower in the omega-3 FAs group on day 7 (P < 0.001).

**Conclusions:** Omega-3 fatty acid administration may be associated with reduced mortality in hospitalized patients with COVID-19. Given the small sample size of enrolled studies, more rigorous and large-scale trials are urgently needed in the future to verify its efficacy.

**Key words** SARS-CoV-2, COVID-19, omega-3 fatty acids, pandemic, mortality

# 膳食矿物质与常见恶性肿瘤患者的营养风险：中国的一项多中心横断面研究

## Dietary minerals and nutrition risk of common malignant tumor patients: a multi-center cross-sectional study in China

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### Objective:

The objective of this academic article is to examine the correlation between mineral intake through diet and the nutritional status of patients suffering from common malignancies.

### Methods:

Participants were recruited 8 hospitals around the China. Briefly, 866 patients with malignant tumors were supplied with detailed information on both dietary mineral intake and nutritional conditions. Dietary intake and appetite scores were collected and the intake amounts of dietary minerals such as calcium ion (Ca), phosphorus ion (P) and sodium ion (Na) were estimated according to the Chinese food composition table. The Global Leaders' Malnutrition Initiative diagnostic criteria for malnutrition and the short Nutritional Risk Screening Scale were used to measure nutritional status.

### Results:

A total of 866 patients with malignant tumors were included, 385 patients (44.5%) with NRS 2002  $\geq 3$  was at nutritional risk, and 283 patients (32.7%) with GLIM  $\geq 2$  were diagnosed with malnutrition. Univariate analysis revealed a statistically significant relationship between dietary mineral intake and the occurrence of nutritional risk ( $p < 0.0001$ ). After controlling for relevant confounders, multivariate Logistic regression analysis revealed that moderate intake of dietary minerals Ca、P、Se and Mn (OR, 95%CI; 0.53, 0.32–0.88; 0.40, 0.24–0.67; 0.59, 0.36–0.98; 0.46, 0.28–0.76) was protective factors for nutritional risk when determining the presence of nutritional risk based on the NRS 2002 scales, and high intakes of dietary minerals P、Zn、Se and Mn (OR, 95%CI; 0.39, 0.21–0.72; 0.36, 0.19–0.68; 0.51, 0.28–0.92; 0.40, 0.22–0.74) was protective factors for nutritional risk, while no dietary mineral intakes were found to be protective factors for malnutrition when judging nutritional status according to GLIM diagnostic criteria.

### Conclusions:

Intake of the dietary minerals P and Se plays a protective role in the nutritional status of patients with malignancy. Moderate intake of the dietary minerals Ca and Mn and higher intake levels of the mineral Zn might be protector against nutritional risk in patients with malignant tumors.

**Key words** Tumor patient; Dietary minerals; Malnutrition; Influencing factor; Nutritional risk

Category: Clinical Nutrition

# 微信平台是管理妊娠期糖尿病患者的方法:一项前瞻性研究

## WeChat Platform is a Good Way to Manage Women with Gestational Diabetes Mellitus: a Prospective Study

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Follow-up rate of postpartum visits for gestational diabetes mellitus (GDM) patients is low and need to be improved. In this prospective trial, GDM patients were enrolled in and were managed throughout their pregnancies via WeChat platform. Questionnaires were sent to collect data about post-partum 75g OGTT results via WeChat platform. From January 2016 to February 2020, 490 participants were included, and 375 completed questionnaires. Among the 375 participants, 277 (73.9%) completed post-partum OGTT. More than two-thirds (72.9%, 202/ 277) had a normal glucose level and less than one third (27.1%, 75/ 277) had an abnormal glucose result. Univariate and multivariate regression analyses were performed and showed that women who failed to return for post-partum OGTT were more likely to report prior GDM than women who returned (OR 0.44, 95% CI 0.20-0.94). Women who had an abnormal post-partum OGTT result were more likely to use insulin treatment during pregnancy (OR 3.74, 95% CI 1.97-7.08) and more likely to deliver by cesarean section (OR 1.83, 95% CI 1.02-3.28) compared to women who had normal post-partum glucose results. In conclusion, rates of postpartum glucose testing after GDM pregnancies may be increased by sending alerts and managing by the WeChat platform.

**Key words** Gestational diabetes mellitus (GDM), Oral glucose tolerance test, Postpartum period, WeChat platform, Insulin treatment.

# 慢性疾病与 COVID-19 患者的疾病严重程度密切相关:系统综述和荟萃分析

## Comorbid Chronic Diseases are Strongly Correlated with Disease Severity among COVID-19 Patients: A Systematic Review and Meta-Analysis

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Coronavirus disease 2019 (COVID-19) has resulted in considerable morbidity and mortality worldwide since December 2019. In order to explore the effects of comorbid chronic diseases on clinical outcomes of COVID-19, a search was conducted in PubMed, Ovid MEDLINE, EMBASE, CDC, and NIH databases to April 25, 2022. A total of 36 peer-reviewed articles, including 32948 COVID-19 cases were selected. We found diabetes was present in 12.0%, coronary artery disease/cardiovascular disease (CAD/CVD) was in 9.0%, and hypertension was in 23.0%, which were much higher than that of chronic pulmonary disease (4.0%). Specifically, preexisting chronic conditions are strongly correlated with disease severity [Odds ratio (OR) 3.80, 95% CI 1.58 to 7.40], and being admitted to intensive care unit (ICU) (OR 3.20, 95% CI 1.80 to 7.86); in addition, compared to COVID-19 patients with no preexisting chronic diseases, COVID-19 patients who present with either diabetes, hypertension, CAD/CVD, or chronic pulmonary disease have a higher risk of developing severe disease, with an OR of 2.81 (95% CI 2.90 to 4.42), 3.04 (95% CI 2.45 to 4.83), 3.54 (95% CI 2.47 to 7.49) and 2.93 (95% CI 2.05 to 8.80), respectively. Surprisingly, we found no correlation between chronic conditions and increased risk of mortality (OR 2.19, 95% CI 0.35 to 15.77). Taken together, cardio-metabolic diseases, such as diabetes, hypertension and CAD/CVD were more common than chronic pulmonary disease in COVID-19 patients, however, each comorbid disease was correlated with increased disease severity. After active treatment, increased risk of mortality in patients with preexisting chronic diseases may reduce.

**Key words** coronavirus disease 2019 (COVID-19), diabetes, cardiovascular diseases, hypertension, chronic pulmonary disease, meta-analysis

Category: Clinical Nutrition

# 非酒精性脂肪肝和心血管疾病的关系

## Nonalcoholic fatty liver disease and cardiovascular disease

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Nonalcoholic fatty liver disease (NAFLD) and cardiovascular disease (CVD) are two diseases that are common in the general population. To date, many studies have been conducted and demonstrate a direct link between NAFLD and CVD, but the exact mechanisms for this complex relationship are not well established. A systematic search of the PubMed database revealed that several common mechanisms are involved in many of the local and systemic manifestations of NAFLD and lead to an increased cardiovascular risk. The possible mechanisms linking NAFLD and CVD include inflammation, oxidative stress, insulin resistance, ectopic adipose tissue distribution, dyslipidemia, endothelial dysfunction, and adiponectin, among others. The clinical implication is that patients with NAFLD are at an increased risk of CVD and should undergo periodic cardiovascular risk assessment.

**Key words** Nonalcoholic fatty liver disease; Cardiovascular disease; Metabolic syndrome; Risk assessment

Category: Clinical Nutrition

## 利拉鲁肽和胰岛素通过 Wnt 信号通路对人脂肪间充质干细胞的成脂分化具有相反作用

### Liraglutide and Insulin Have Contrary Effects on Adipogenesis of Human Adipose-Derived Stem Cells via Wnt Pathway

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**Background:** Glucagon-like peptide-1 (GLP-1) has been reported to have beneficial impacts on improving human's metabolism and ameliorating insulin resistance. While insulin is another important and conventional drug in diabetes treatment, but it has an adverse effect on weight gain.

**Purpose:** To make sure whether GLP-1 and insulin play different roles in human adipose-derived stem cells(hADSCs).

**Methods:** We examined the in vitro roles and molecular mechanisms of liraglutide, a GLP-1 analogue, and human insulin on hADSCs isolated from subcutaneous adipose tissue. Different concentrations (0, 0.1, 1, 10, 100nM) of liraglutide and insulin were added to proliferation and differentiation medium of hADSCs, respectively.

**Results:** Liraglutide inhibits while insulin promotes the proliferation and differentiation at the concentration of 100nM. Moreover, the levels of GSK-3 increase during differentiation and liraglutide could down-regulate it when compared with insulin. We also find that the activation of phosphorylated GSK-3 $\alpha$  and GSK-3 $\beta$  is involved in the differentiation roles. And classical and non-classical Wnt pathways all play roles in the differentiation, which are characterized with the up/down-regulation of the expression of adipogenesis genes such as PPAR- $\gamma$  and CEBP- $\alpha$ .

**Conclusion:** Liraglutide and insulin have contrary effects on the proliferation and adipogenesis via Wnt pathway in primary cultured ADSCs. Those effects could partly explain the different roles of GLP-1 and insulin on weight gain and insulin resistance.

**Key words** liraglutide, insulin, human adipose-derived stem cells, obesity, Wnt signaling pathway

## **NRS-2002 和 MUST 作为 GLIM 第一步诊断克罗恩住院患者营养不良——一项回顾性研究**

### **GLIM criteria using NRS-2002 and MUST as the first step adequately diagnose the malnutrition in Crohn' s disease inpatients: A retrospective study**

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**Objective:** This study aims to investigate the incidence of nutritional risk and malnutrition in Crohn' s disease inpatients and compare the suitability of Nutritional Risk Screening 2002 (NRS-2002) and Malnutrition Universal Screening Tool (MUST) as the first-step screening tool for GLIM criteria. **Methods:** We selected the clinical data of Crohn' s disease inpatients in our hospital from August 2016 to December 2019. NRS-2002 and MUST were used for nutritional screening. GLIM and PG-SGA were used for malnutrition assessment, respectively. Patients without nutritional risk screened by NRS-2002 but with malnutrition risk screened by MUST were especially screened out. ASMI, FFMI, BFP, and body cell mass were measured by the Biospace Inbody S10 composition analyzer. **Results:** A total of 146 Crohn' s disease patients were enrolled, of which 62.3 and 89.7% had nutritional or malnutrition risk according to NRS-2002 and MUST, respectively. The prevalence of malnutrition assessed by GLIM was 59.6% (87 cases) and 82.2% (120 cases) when NRS-2002 and MUST were used as the first step of GLIM respectively. Meanwhile, 99 patients (67.8%) had malnutrition when assessed by PG-SGA. There were 41 patients who were not at nutritional risk according to NRS-2002 but were at malnutrition risk determined by MUST. At last, 33 patients were GLIM-defined, and 16 patients were PG-SGA-defined malnutrition among the 41 patients. **Conclusion:** The nutritional risk or malnutrition is common in Crohn' s disease inpatients. It is recommended to use a variety of nutritional assessment tools for Crohn' s disease inpatients. MUST can be used as a good supplement for the patients with a score of NRS-2002 lower than 3 in order to decrease the miss rate of GLIM-defined malnutrition.

**Key words** nutritional risk, malnutrition, nutritional risk screening 2002, Malnutrition Universal Screening Tool (MUST), Global Leader Initiative on Malnutrition (GLIM)



# 早期肠内营养对接受机械通气的新冠患者预后的影响：系统评价和 meta 分析

## Early enteral nutrition for mechanically ventilated COVID-19 patients: A systematic review and meta-analysis

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**Background:** This study aims to systematically review the efficacy of early enteral nutrition for mechanically ventilated Corona Virus Disease 2019 (COVID-19) patients.

**Methods:** Relevant clinical studies published from December 2019 to March 2023 were retrieved from the electronic databases. The primary outcome was overall mortality. The secondary outcomes included length of hospitalization, intensive care unit length of stay, and duration of mechanical ventilation. The quality of enrolled studies was evaluated using the ROBINS-I tool. The meta-analysis was performed using RevMan 5.4 software.

**Results:** A total of 1229 potentially relevant titles and abstracts were screened. After reviewing, five studies enrolling 2054 patients were eventually included. All five articles were retrospective cohort studies. There was no significant difference in overall mortality [relative risk=0.92, 95% confidence interval (0.74, 1.15),  $P=0.48$ ] between the early enteral nutrition group and late enteral nutrition group. The patients who received early enteral nutrition tend to stay in the hospital for less time but the difference is not significant [mean difference = -4.82, 95% confidence interval (-11.47, 1.83),  $P=0.16$ ]. The patients who received early enteral nutrition was on mechanical ventilation for less time [mean difference = -0.70, 95% confidence interval (-0.99, -0.40),  $P<0.00001$ ].

**Conclusion:** Early enteral nutrition help wean patients from the ventilator, and may reduce intensive care unit hospitalization, and help reach the feeding target of ventilated patients with COVID-19. Owing to the small number of included studies and the relative low quality of study design, more rigours, large scale clinical trials are urgent needed to verify above findings.

**Key words** Early enteral nutrition; COVID-19; Mechanical ventilation; Systematic Review; Meta-analysis

# 客观营养指数评价新冠肺炎住院患者营养不良状况及其与预后的关系

## Evaluation of Malnutrition by Objective Nutritional Index and Association with Prognosis in hospitalized patients with COVID-19

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**Background and Objective:** we aimed to (1) investigate the prevalence of nutrition risk defined by NRS2002 and malnutrition assessed by the objective indexes (PNI and COUNT) in hospitalized patients with COVID-19; (2) observe the nutritional intervention for them; (3) explore predictors for discerning the critical patients and predicting the mortality of patients with COVID-19.

**Methods and Study Design:** Present study was a monocentric retrospective study. We included a total of 464 hospitalized patients confirmed with COVID-19 between December 2022 and January 2023 at Ningbo Medical Center Lihuili Hospital, China. Data on clinical features, complications, laboratory parameters and nutrient requirement were analyzed retrospectively. ROC curve analysis was used to discern critical patients and mortality with COVID-19.

**Results:** The incidence of nutritional risk was 53.00% (246/464) among these patients. The prevalence of malnutrition was 79.09% and 88.79%, as diagnosed by the PNI and COUNT, respectively. The total in-hospital mortality was 3.02% (14/464). Univariate analysis revealed that older age, lower BMI and Comorbidities including diabetes, hypertension and cardiovascular were significant associated with nutritional risk. Among 464 patients, only 107 (23.06%) cases received nutritional support. The cut-off value  $\geq 817.54$  for SII and  $\geq 5.5$  for COUNT was associated with a higher risk of critical cases in COVID-19 patients, and the cut-off value  $\geq 3274.34$  for SII and  $\geq 5.5$  for COUNT was associated with a higher risk of mortality in the ROC curve analysis.

**Conclusions:** The incidence of nutritional risk and malnutrition was high among hospitalized patients with COVID-19. The SII and COUNT scores are independent predictors of the prognosis for the disease severity and mortality in hospitalized COVID-19 patients.

**Key words** malnutrition, COVID-19, PNI, COUNT, SII

Category: Clinical Nutrition

## **CT 与 BIA 在老年肌肉衰减症患者体成分评估中的比较**

### **Comparison of CT and BIA in the Assessment of Body Composition in elderly patients with Sarcopenia**

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Peking Union Medical College Hospital

**Background:** Sarcopenia is defined as a syndrome with decline in muscle mass and strength associated with functional decline. Accurate methods for assessing body composition in elderly patients with sarcopenia are essential to determine muscle condition as well as monitor therapeutic interventions.

**Objectives:** The purpose of our study was to compare the accuracy of measurements of body composition made using analysis of computed tomography (CT) scans at the L3 vertebral level, and bioelectrical impedance analysis (BIA).

**Methods and Study Design:** The diagnosis of sarcopenia were based on the definition of primary sarcopenia produced by the Asian Working Group for Sarcopenia (AWGS). CT and BIA were performed in 14 patients recruited from a clinical trial investigating age-related sarcopenia with no more than seven days apart. CT image slices at the third lumbar vertebrae (L3) level were analyzed using SliceOmatic V4.2 software (Tomovision, Montreal, Canada) to calculate the surface area of the muscle tissue and adipose tissue.

**Results:** Our results show strong correlations between fat-free mass on CT and BIA ( $r=0.8696, P<0.0001$ ) and fat mass on CT and BIA ( $r=0.9255, P<0.0001$ ). On Bland-Altman analysis, two methods showed ideal consistency. Average bias for fat-free mass on CT and BIA was  $-4.3289$  with 95% limits of agreement (LOA) of  $-10.0020$  to  $1.3443$ . For fat mass on CT and BIA, average bias was  $2.8717$ , with 95% limits of agreement (LOA) of  $-1.8720$  to  $7.6155$ .

**Conclusions:** Our study showed that BIA underestimated fat mass and overestimated fat-free mass compared with CT when assessing sarcopenia. If patients with sarcopenia are overestimated by using the BIA method to assess muscle mass, appropriate treatments including nutritional and exercise interventions may be delayed and may affect prognosis.

**Key words** Sarcopenia, Body Composition, Anthropometry, Electric Impedance, Tomography X-Ray Computed

Category: Clinical Nutrition

# **体重减轻对鼻咽癌患者无进展生存期影响的定量评估**

## **Quantitative evaluation of the effect of weight loss on the Progress Free Survival of patients with nasopharyngeal carcinoma**

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### OBJECTIVE

Critical weight loss plays an important role in nasopharyngeal carcinoma (NPC) severity, and is associated with worse therapeutic outcomes. While there is no national or international consensus on weight loss cutoff points to identify the point at which patients with NPC should be urged to initiate dietitian referrals. Therefore, we performed a repeated weight assessment and systematic and statistical interpretation of data on a NPC cohort to define an effective indicator for weight loss in patients with NPC to address the gap in knowledge regarding the relationship between weight loss and NPC prognosis.

### MATERIALS AND METHODS

681 newly diagnosed NPC patients were included in our retrospective cohort analysis. Cox regression model was performed to select the most effective indicator for weight loss, and restricted spline curve was plotted to determine potential cutoff values. Cox proportional hazards model and Kaplan-Meier method were conducted to select and verify the best cutoff values for prognosis prediction. C-index was performed to assess the prognostic predictive value of PWL in NPC.

### RESULT

Among three alternative indicators, percent weight loss (PWL) was the most important information retaining variable for NPC prognosis. The risk of tumor progression of NPC increased almost linearly with the increasing of PWL, and cutoff values, 6.3% and 13.2%, effectively differentiate patients into different risk groups (5-year PFS 84.5%, 77.9%, 67.3% in low-, medium- and high-risk groups respectively). These PWL cutoff values improved the predictive capability of traditional prognostic model in NPC progression (0.675 in traditional model vs. 0.697 in PWL model  $P=0.004$ ).

### Conclusion

These results suggested that PWL appeared to be a promising prognostic predictor for NPC. Stratifying patients with NPC based on the present cutoff values may help in identifying patients at higher risk for worse outcomes.

**Key words** nasopharyngeal carcinoma; weight loss; cut-off values; PFS

# 标准肠内营养与免疫调节肠内营养治疗对食管癌临床疗效的影响： 系统评价和荟萃分析

## Clinical efficacy of standard enteral nutrition and immunomodulating enteral nutrition in treatment of esophageal cancer: a systematic review and meta-analysis

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**Objectives:** To compare the effects of standard enteral nutrition with immunomodulating enteral nutrition on postoperative outcomes in patients with esophageal cancer.

**Methods:** A comprehensive search of PubMed, Cochrane and Web of Science for articles published from January 2000 to March 2023 was conducted to collect randomized controlled clinical studies on the association of standard enteral nutrition and immunomodulating enteral nutrition with clinical outcomes in esophageal cancer. Perioperative outcomes included postoperative infectious complications and postoperative length of hospital stay. Long-term outcomes included 2-year mortality. The results were analyzed using systematic evaluation methods, and the combined odds ratios (ORs) and 95% confidence intervals (CIs) were calculated. After data extraction and quality analysis of the included literature, meta-analysis was performed using RevMan 5.4 software.

**Results:** Seven studies reporting 642 subjects (397 in the intervention group and 245 in the control group) were included. The intervention group was treated with IMPACT (Novartis/Nestlé) immunomodulating enteral nutrition which contains  $\Omega$ -3 fatty acids, arginine and nucleotides, while the control group was treated with standard enteral nutrition. All the components except the extra immunomodulatory nutritional substrates were exactly the same between the two groups. Meta-analysis showed that immunomodulating enteral nutrition had no statistically significant effect on postoperative infection complications (OR= 0.84; 95% CI: 0.53, 1.32; P= 0.44), length of hospital stay (MD= -1.91; 95% CI: -5.60, 1.77; P= 0.31) and 2-year mortality (OR= 0.78; 95% CI: 0.34, 1.75; P= 0.54).

**Conclusions:** Immunomodulating enteral nutrition may improve perioperative outcomes and reduce 2-year mortality in patients with esophageal cancer, but the difference is not significant compared to standard enteral nutrition given the short follow-up period and the inadequate sample size of the retrieved studies. Therefore, further confirmation is needed to improve the understanding of immunomodulating enteral nutrition.

**Key words** Standard enteral nutrition; Immune enteral nutrition; Esophageal cancer; Nutritional therapy; Meta-analysis.

Category: Clinical Nutrition

# 系统评价新冠肺炎营养干预临床研究的方法学质量

## Methodological Quality Assessment of Clinical Studies Investigating Nutrition Interventions for COVID-19

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2. West China Second University Hospital

**Aim:** To evaluate the methodological quality of clinical studies regarding nutrition interventions for coronavirus disease 2019 (COVID-19).

**Methods:** We searched six databases from inception to January 2023. We included randomized controlled trials (RCTs), non-randomized controlled trials, cohort studies and case-control studies exploring the role of nutrition interventions in the prevention and treatment of COVID-19 disease and post-COVID syndrome. Risk of bias was assessed by the Cochrane Risk of Bias Tool (RoB2) for RCTs, the Risk Of Bias In Non-randomised Studies of Interventions (ROBINS-I) for non-randomized controlled trials, and the Observational Study Quality Evaluation (OSQE) for cohort studies and case-control studies.

**Results:** A total of 27 studies were included, including 13 RCTs and 14 cohort studies. Twenty types of nutrition interventions were involved in these studies, and all these nutrition interventions were reported to have beneficial effects on COVID-19 disease or post-COVID syndrome except glutamine. Judging by RoB2, all the 13 RCTs were rated at high risk of bias. Judging by OSQE, 1 (7%) cohort study was rated at low risk of bias, 9 (64%) cohort studies were rated at moderate risk of bias, and 4 (29%) cohort studies were rated at high risk of bias.

**Conclusion:** Most of the clinical studies regarding nutrition interventions for COVID-19 seem insufficiently protected against bias. Improving the methodological quality of clinical studies should be a top priority in this field.

**Key words** nutrition interventions; COVID-19; methodological quality; RCT; cohort study

# 婴幼儿期 0-2 岁体格发育轨迹与青春早期血压和心率的关联:基于中国西部农村的出生队列研究

## Life-course physical growth trajectories from birth to two years of age and blood pressure at early adolescence: a birth cohort

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### Objectives

To examine the associations of life-course physical growth trajectories from birth to two years of age with adolescent blood pressure (BP), and the causal mediating role of adolescent current adiposity and puberty onset.

### Methods

We analyzed data from a prospective birth cohort of children born to mothers who participated in a randomized controlled trial of antenatal micronutrient supplementation in China. We measured infant weight and length at birth, 1, 3, 6, 9, 12, 18, and 24 months of age, which were converted into z scores by the INTERGROWTH-21st and WHO standards. Adolescent BP was assessed using a validated electronic sphygmomanometer and converted into percentiles by sex, age and height. We used group-based trajectory modeling to identify the weight-, length-, BMI- and weight-for-length-for-age and sex z score (WAZ, LAZ, BAZ, WFL) trajectories during the first two years, and examined their associations with adolescent BP. The natural indirect effect (NIE) and proportions mediated (PM) by adolescent BAZ and puberty onset were estimated by inverse odds ratio weighting.

### Results

Among 1388 infants enrolled for long-term follow-up, 741 (60.9% male) adolescents aged 10-14 were followed, with a mean age of 11.26 (SD, 0.57). Distinct growth trajectories were identified, implying catch-up growth after birth. BAZ and WFL trajectories were associated with adolescent systolic and diastolic BP and BP percentiles, with adjusted mean differences ranging from 1.70 to 5.29 mmHg. In addition, these relationships between growth trajectories and adolescent systolic BP percentiles were largely mediated by adolescent BAZ with maximum PMs of 87%, while the corresponding PMs of puberty onset were small with NIEs crossing null points. The NIEs were not statistically significant for adolescent diastolic BP.

### Conclusions

Early-life growth trajectories from birth may have causal relationships with adolescent systolic BP. Routine monitoring infant growth has the potential utility to predict the life-long risk of hypertension and other cardiovascular diseases.

**Key words** birth cohort, physical growth, life-course trajectory, blood pressure, early adolescence

## 炎症相关营养筛查工具与血液肿瘤患者住院时长的关系

# The association between an inflammation-based nutritional tool (Glasgow Prognostic Score) and length of hospital stay in patients with haematological cancer

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**Objective:** Glasgow Prognostic Score (GPS) is a prognostic tool that combined an inflammatory marker [C-Reactive Protein (CRP)] with a nutritional marker (serum albumin). Yet, there is few published work on the reliability of GPS in patients with haematological cancer.

**Methods:** This is a retrospective single-centre study. All the participants were adult inpatients in Ren Ji Hospital between 2018 and 2022. Serum levels of CRP and albumin were measured at admission. GPS was calculated as follows: point "0" as CRP<10 mg/L and albumin≥35 g/L; point "2" as CRP≥10 mg/L and albumin<35 g/L; point "1" as either CRP≥10 mg/L or albumin<35 g/L. Patients with point "0" were classified as low-risk while point "2" as high-risk. Length of hospital stay (LOS) was defined as the interval between admission and discharge date. Other information, including general characteristics, liver and renal function tests, and full blood counts, were obtained from the medical records.

**Results:** Of 1,621 patients, 8.8% of patients were high risk. The average age is 59.6 y and the average LOS is 6.0 d. GPS was associated with LOS ( $\beta=2.7$  d; 95% CI: 0.8 d, 4.6 d;  $p$  trend<0.001) after adjustment of sex, age, type of disease, BMI, alanine aminotransferase, aspartate aminotransferase, total bilirubin, estimated glomerular filtration rate, haemoglobin, red blood cell count, white blood cell count, and fasting blood glucose. Each point of GPS was associated with 1.9 days (95% CI: 1.4 d, 2.4 d) longer in LOS with full adjustment. The association was more prominent in younger patients (<65 y), patients with leukaemia and myelodysplastic syndrome, and those with normal body weight status (18.5–24 kg/m<sup>2</sup>), compared with their counterparts.

**Conclusion:** GPS was associated with LOS in Chinese patients with haematological cancer, indicating GPS could be a useful assessment tool to predict outcome.

**Key words** Glasgow Prognostic Score, length of hospital stay, haematological cancer



# **活动性肺结核患者的营养状况研究及营养筛查新模型的建立：一项全国性、多中心、大样本回顾性研究**

## **Nutritional status in patients with active pulmonary tuberculosis and new nutritional risk screening model for active tuberculosis: a national, multicenter, cross-sectional study in China**

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### **Abstract**

**Background:** Tuberculosis (TB) remains a significant challenge for public health and is closely associated with malnutrition; however, few studies have attempted to screen malnutrition among TB patients. The study aimed to evaluate the nutrition status and build a new nutritional screening model for active TB.

**Methods:** A retrospective, multicenter, large cross-sectional study was conducted in China from 1 January 2020 to 31 December 2021. All included patients diagnosed with active pulmonary TB (PTB) were evaluated both by Nutrition Risk Screening 2002 (NRS 2002) and Global Leadership Initiative on Malnutrition (GLIM) criteria.

Univariate and multivariate analyses were conducted to screen the risk factors associated with malnutrition, and a new screening risk model, mainly for TB patients, was constructed.

**Results:** A total of 14,941 cases meeting the inclusion criteria were entered into the final analysis. The malnutrition risk rate among PTB patients in China was 55.86% and 42.70%, according to the NRS 2002 and GLIM, respectively. The inconsistency rate between the two methods was 24.77%. A total of 11 clinical factors, including elderly, low body mass index (BMI), decreased lymphocyte cells, taking immunosuppressive agents, co-pleural TB, diabetes mellitus (DM), human immunodeficiency virus (HIV), severe pneumonia, decreased food intake within a week, weight loss and dialysis were identified as independent risk factors of malnutrition based on multivariate analyses. A new nutritional risk screening model was constructed for TB patients with a diagnostic sensitivity of 97.6% and specificity of 93.1%.

**Conclusions:** Active TB patients have severe malnutrition status according to screening by the NRS 2002 and GLIM criteria. The new screening model is recommended for PTB patients as it is more closely tailored to the characteristics of TB.

**Key words** Nutritional risk; malnutrition; Nutrition Risk Screening 2002 (NRS 2002); Global Leadership Initiative on Malnutrition (GLIM); model

Category: Clinical Nutrition

# 血脂相关指标在肌肉衰减症和骨骼肌衰减中的作用

## Role of circulating lipid factors in Skeletal Muscle Atrophy and Sarcopenia

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**Background & Objective:** Compelling evidence supports a role for excess fatty acids synthesized in intramuscular space or dietary intermediates resulting in skeletal muscle function decline. Thus, our study aimed to explore complex interactions between circulating lipid factors and sarcopenia in older people and analyze their potential mechanisms.

**Methods:** Muscle mass (MM), hand grip strength (HGS), physical performance, circulating factors, and metabolic markers were measured during cross-sectional study in Peking Union Medical College Hospital (PUMC Hospital) multicenter prospective longitudinal sarcopenia study (PPLSS).

**Results:** The sarcopenic group had significantly higher serum high-density lipoprotein cholesterol (HDL-C) ( $1.59 \pm 0.56$  vs.  $1.29 \pm 0.33$  mmol/L,  $P=0.01$ ) and lower serum total triglyceride level ( $1.11 \pm 0.61$  vs.  $1.38 \pm 0.76$  mmol/L,  $P=0.017$ ). Pre-sarcopenic ( $1.50 \pm 0.62$  mmol/L), sarcopenic ( $1.57 \pm 0.20$  mmol/L) and severe sarcopenic subjects ( $1.48 \pm 0.56$  mmol/L) were higher HDL-C levels than control subjects, and pre-sarcopenic subjects presented lowest total triglyceride level ( $1.00 \pm 0.47$  mmol/L), probably sarcopenic subjects shown the highest level ( $1.58 \pm 0.91$  mmol/L). High level of HDL-C was associated with a 5.3-fold increased risk of sarcopenia [OR=5.272, 95%CI (2.163, 12.848)], while serum total triglyceride level was protective from sarcopenia [OR=0.546, 95%CI (0.309, 0.965)]. Based on the analysis of dietary fat and cholesterol content, it was found that fat and cholesterol from meat are protective factors for sarcopenia [for dietary fat from meat, OR=0.900, 95%CI (0.843, 0.972); for dietary cholesterol from meat OR=0.983, 95%CI (0.971, 0.999)].

**Conclusions:** High level of the circulating lipid cytokines HDL-C was associated with an increased risk of sarcopenia, while the total triglyceride was associated with a decreased risk of sarcopenia in our Chinese patient cohort. The reason why high serum HDL-C level resulted in muscle mass loss is that high cholesterol levels reduce insulin levels rather than dietary fat and cholesterol, which indicated the elderly persons should take an appropriate amount of meat

**Key words** Sarcopenia; Sarcopenic Obesity; Cholesterol; Insulin; Dietary fat

Category: Clinical Nutrition

# 血清微量元素水平与早产低体重儿出生结局的关系

## ASSOCIATION OF SERUM TRACE ELEMENT LEVELS WITH BIRTH OUTCOMES IN PRETERM LOW BIRTH WEIGHT INFANTS

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**Background and Objectives** This study aimed at evaluating the relationship between serum trace element levels and gestational age (GA), anthropometric parameters at birth, and complications in preterm low birth weight (LBW) infants.

**Methods and Study Design** From March 2020 to August 2020, infants whose GA < 37 weeks and birth weight (BW) < 2500 g admitted to the neonatal intensive care unit (NICU) within 24 hours after birth were included. The concentrations of serum trace element levels were measured by inductively coupled plasma mass spectrometry (ICP-MS) within 48 hours after birth. Correlations of the levels of zinc (Zn), copper (Cu), selenium (Se), Manganese (Mn) and GA, anthropometric parameters at birth, and complications were determined.

**Results** A total of 83 premature infants were enrolled, including 46 male infants (55.4%) and 37 female infants (44.6%) with GA of 32.3 (29.9, 34.0) weeks and BW of 1650 (1300, 1960) g. Serum Zn levels were 1.22 (1.03, 1.43) mg/L, Cu levels were 180.30 (134.00, 275.30)  $\mu$ g/L, Se levels were  $(40.76 \pm 6.66)$   $\mu$ g/L and Mn levels were 3.65 (2.05, 4.52)  $\mu$ g/L. Cu levels were inversely correlated with BW-for-age z scores ( $r = -0.451$ ,  $P = 0.000$ ) and length-for-age z scores at birth ( $r = -0.231$ ,  $P = 0.036$ ). Se levels were positively correlated with head circumference (HC) at birth ( $r = 0.290$ ,  $P = 0.009$ ). Mn levels were significantly higher in premature infants with hyperbilirubinemia than those without ( $P < 0.05$ ).

**Conclusions** Preterm LBW infants had lower serum Cu levels after birth and intrauterine growth restriction might influence serum Cu levels. Serum Mn levels were higher and there was a significant difference between preterm infants with and without hyperbilirubinemia.

**Key words** trace elements, low birth weight, preterm infants, birth outcomes, serum trace element levels

# 早产低体重儿肠外营养中的血清微量元素水平及微量元素补充剂安全性

## SERUM TRACE ELEMENT LEVELS AND SAFETY OF TRACE ELEMENTS SUPPLEMENTATION FOR PARENTERAL NUTRITION IN PRETERM LOW BIRTH WEIGHT INFANTS

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**Background and Objectives** To evaluate the serum levels of trace elements and the safety of multi-trace element injection I [MTEI-(I)] for parenteral nutrition in preterm LBW infants.

**Methods and Study Design** From March to August 2020, infants were included with GA <37 weeks and BW <2500g admitted to NICU within 24 hours after birth. PN with MTEI-(I) at 1 ml · kg · day was administrated to the infants. The concentrations of serum trace element levels were detected by ICP-MS pre- and post-supplementation. The weight of infants was measured every day. Length, head circumference, pre-albumin (pre-ALB), albumin (ALB), C-reactive protein (CRP), procalcitonin (PCT), routine blood tests, liver and kidney functions and adverse drug reactions (ADR) of infants were monitored and detected.

**Results** A total of 43 preterm infants were enrolled, including 22 male infants and 21 female infants with GA of  $(31.4 \pm 2.4)$  weeks and BW of 1430(1200, 1830)g. Administration of MTEI-(I) in parenteral nutrition was initiated 2(1, 2) days after birth, and continued for 11(9, 17) days. Serum Cu and Se levels were higher than those in pre-parenteral nutrition ( $P < 0.05$ ), whereas serum Mn levels were lower than those before ( $P < 0.05$ ). A positive correlation between serum Zn levels after supplementation and weight growth velocity in hospitalized preterm LBW infants was found ( $P < 0.05$ ). Serum Se levels were positively correlated with weight and weight-for-age z-scores at discharge ( $P < 0.05$ ). Additionally, PCT, aspartate transaminase (AST), gamma-glutamyl transferase (GGT), total bilirubin (TB), blood urea nitrogen (Bun) was significantly lower ( $P < 0.05$ ), while pre-ALB, alkaline phosphatase (AKP), direct bilirubin (DB), creatinine (Cr) were higher ( $P < 0.05$ ).

**Conclusions** Parenteral supplementation of MTEI-(I) at 1 ml · kg · day was safe for preterm LBW infants and might increase serum Cu levels, maintain the levels of serum Zn and Se, and improve serum Mn levels.

**Key words** trace elements, low birth weight, preterm infants, efficacy safety, baby

# 室间隔缺损患儿住院期间营养风险筛查及临床结局 NUTRITION RISK SCREENING AND CLINICAL OUTCOMES OF PEDIATRIC PATIENTS DURING HOSPITALIZATION FOR VENTRICULAR SEPTAL DEFECT

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**Background and Objectives** The study aimed at analyzing the Screening Tool for the Assessment of Malnutrition in Pediatrics (STAMP) scores of hospitalized children with ventricular septal defect (VSD).

**Methods and Study Design** Children with VSD discharged from SCMC between January 2019 and December 2020 were enrolled. Data including age at admission, anthropometric measurements, STAMP scores, LOS, and hospitalization cost were collected retrospectively. A STAMP score  $\geq 4$  indicated high nutrition risk (HNR). Otherwise, a score of 0-3 reflected low and medium nutrition risk (LMNR). Analysis was performed to find if there were statistically significant differences in multiple variables between different nutrition risk groups and patients with or without malnutrition.

**Results** 1. 3,100 pediatric patients were admitted with VSD. Highest STAMP scores during hospitalization were compared and showed that 7% (n=32/455) cardiac patients, 52% (n=1343/2557) patients undergoing cardiac surgery, and 62.5% (n=55/88) ICU patients were categorized as high nutrition risk.

2. VSD patients with high nutrition risk had longer LOS ( $p=0.000$ ), higher total costs of hospitalization ( $p=0.000$ ), and higher costs of antibiotics ( $p=0.000$ ).

3. The prevalence of VSD pediatric patients with acute and chronic malnutrition at admission was 16.0% and 16.6%, respectively. There were no statistically significant differences in antibiotics costs, total daily costs, and daily antibiotics costs between two groups. Nor did the study find significant differences in LOS, total costs of hospitalization, costs of antibiotics, total daily costs, and daily costs of antibiotics.

**Conclusions** The incidence of high malnutrition risk in VSD patients during hospitalization was 46.1%. Surgical patients with VSD had a higher proportion of HNR (52.5%). Compared with weight and height at admission, nutrition risk screening results were better in forecasting indicators such as LOS, total cost, cost of antibiotics, and daily costs, thus implying the necessity of regularly screening VSD pediatric patients for nutrition risks during hospitalization.

**Key words** Nutrition risk screening, Children, ventricular septal defect, STAMP, Hospitalization

Category: Clinical Nutrition

## 两种脂肪乳剂静脉滴注对早产儿临床结局的影响

# THE EFFECTS OF TWO KINDS OF INTRAVENOUS FAT EMULSION ON THE CLINICAL OUTCOME OF PREMATURE INFANTS

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**Background and Objectives** To evaluate the effects of two kinds of intravenous fat emulsion on the clinical outcome of premature infants, further evaluate the clinical efficacy and safety of SMOF fat emulsion in premature infants and finally provide clinical evidence for the application of SMOF in premature infants.

**Methods and Study Design** Preterm infants (gestational week  $\leq 37$ W, birth weight  $\leq 2000$ g, admission 72h after birth, PN support  $\geq 14$  d) in neonatal intensive care unit (NICU) of our hospital from May 1, 2018 to October 31, 2019 were divided into SMOF group and MCT/LCT group separately. Subjective respectively added the fat emulsion to PN from the initial dose of 1.0g/kg/d, increased to 3g/kg/d at the speed of 0.5-1.0g/kg/d. Other nutritional support conditions were completely consistent. Blood samples were collected before PN and 14 days after PN. The liver enzyme levels, kidney function, inflammatory factors, nutritional indicators and incidence rate of PNAC, duration of PN use and length of hospital stay were collected.

**Results** A total of 182 premature infants were included in the study. In terms of growth and development index, the weight of the SMOF group recovered earlier to the age of birth ( $p < 0.05$ ). Furtherly, there was no significant difference between initial fat emulsion, initial amino acid use and in liver function indexes, renal function indexes, infection indexes and nutritional indexes between the two groups at 0 and 14 days. Additionally, PN use duration in SMOF group was shortened ( $p < 0.05$ ). The incidence of PNAC was low.

**Conclusions** Under the standard application of PN, the weight of SMOF group recovered earlier to birth age and PN duration was significantly shortened, which may be related to the increased gastrointestinal tolerance of SMOF. SMOF can shorten the duration of PN use and the time to return to the birth date.

**Key words** Fat emulsion, Baby, Premature infant, SMOF, Parenteral Nutrition

# COVID-19 封城后肥胖儿童的代谢特征

## METABOLIC CHARACTERISTICS AMONG CHILDREN WITH OBESITY POST-COVID-19 LOCKDOWN

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**Background and Objectives** To investigate the prevalence of obesity and metabolic characteristics in children pre- and post-COVID-19 home confinement.

**Methods and Study Design** A cross-sectional study was conducted on children with obesity visiting the nutrition clinic of Shanghai Children's Medical Center from April to August 2020 (Group 2020) and in the identical months of 2019 (Group 2019).

**Results** 114 (7.35%) patients in Group 2019 were diagnosed with overweight or obesity, whereas 176 (9.87%) in Group 2020 ( $P=0.010$ ). Increased rates of insulin resistance ( $n=63$ , 35.8% vs.  $n=25$ , 21.9%,  $P=0.014$ ), impaired fasting glucose ( $n=31$ , 17.6% vs.  $n=8$ , 7.01%,  $P=0.010$ ), impaired glucose tolerance ( $n=13$ , 7.39% vs.  $n=2$ , 1.75%,  $P=0.034$ ), non-alcohol fatty liver disease ( $n=38$ , 21.6% vs.  $n=11$ , 9.65%,  $P=0.008$ ), vitamin D deficiency ( $n=31$ , 21.0% vs.  $n=4$ , 2.63%,  $P=0.000$ ) and insufficiency ( $n=37$ , 17.6% vs.  $n=3$ , 3.51%,  $P=0.000$ ) were observed in Group 2020.

School children ( $64.16 \pm 21.33$  vs.  $51.77 \pm 19.89$  cm<sup>2</sup>,  $P=0.009$ ), pre-adolescents ( $97.01 \pm 27.84$  vs.  $77.42 \pm 26.50$  cm<sup>2</sup>,  $P=0.008$ ), adolescents ( $125.15 \pm 31.42$  vs.  $86.79 \pm 33.87$  cm<sup>2</sup>,  $P=0.002$ ), patients diagnosed with class I ( $69.51 \pm 25.85$  vs.  $43.55 \pm 19.67$  cm<sup>2</sup>,  $P=0.001$ ) and class II obesity ( $86.23 \pm 32.36$  vs.  $54.83 \pm 21.95$  cm<sup>2</sup>,  $P=0.003$ ) in Group 2020 gained more visceral adipose tissue. In addition, preschoolers and school children in Group 2020 had higher fasting insulin levels ( $12.2 \pm 6.79$  vs.  $5.32 \pm 0.85$   $\mu$  IU/mL,  $P=0.021$ ;  $14.56 \pm 9.45$   $\mu$  IU/mL,  $P=0.037$ ) and HOMA-IR values ( $3.16 \pm 1.96$  vs.  $1.19 \pm 0.26$ ,  $P=0.021$ ;  $3.24 \pm 2.00$  vs.  $2.3 \pm 1.25$ ,  $P=0.017$ ). A positive correlation of visceral fat area existed with fasting insulin levels ( $r=0.592$ ,  $P=0.000$ ), 2-hour postprandial insulin ( $r=0.326$ ,  $P=0.000$ ), HOMA-IR ( $r=0.583$ ,  $P=0.000$ ) and serum uric acid levels ( $r=0.433$ ,  $P=0.000$ ) while negative with serum 25-hydroxy vitamin D levels ( $r=-0.415$ ,  $P=0.001$ ).

**Conclusions** COVID-19 homebound children without obesity might turn increasingly centrally obese and suffer from pre-diabetes at a lower age.

**Key words** Obesity, COVID-19, Children, Metabolic, Prediabetes

## 65 岁及以上 2 型糖尿病患者的血清维生素 D 水平与合并高血压的关系

### Association of serum vitamin D levels with combined hypertension in patients aged 65 years and older with Type 2 Diabetes Mellitus

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**BACKGROUND:** Epidemiological studies have found that vitamin D is associated with glucose metabolism as well as endothelial function. The aim of this study was to investigate the relationship between vitamin D levels and complicated hypertension in type 2 diabetic (T2DM) patients aged 65 years and older. **METHODS:** In this cross-sectional study, 602 T2DM admitted to the Department of Endocrinology at Xinhua Hospital from December 2015 to July 2018 were divided into a non-hypertensive group (n=207) and a hypertensive group (n=395). Basic information and laboratory results were collected from the medical records. **RESULTS:** Among these patients, combined hypertension accounted for 65.61%. Patients in the hypertensive group had lower serum 25(OH)D concentrations than those in the non-hypertensive group ( $P < 0.05$ ). The results of binary logistic regression showed that low vitamin D concentration was a risk factor for combined hypertension in diabetic patients aged 65 years and older ( $P < 0.05$ ). In addition, serum 25(OH)D levels  $< 34.85$  nmol/L according to ROC analysis indicated that hypertension may be present in patients aged 65 years and older with T2DM ( $P < 0.05$ ). **CONCLUSION:** This study suggests an association between vitamin D level and complicated hypertension with serum 25(OH)D  $< 34.85$  nmol/L indicating possible hypertension in T2DM patients aged 65 years and older. Further studies are required to evaluate the causative relationships between serum 25(OH)D and hypertension, the effect of vitamin D supplementation on hypertension, and patients with T2DM.

**Key words** Type 2 DM, Vitamin D, Hypertention



# 骨钙素在男性 2 型糖尿病患者的维生素 D 和葡萄糖稳态之间的关联中具有调解作用

## Osteocalcin has a mediation role in the association between vitamin D and glucose homeostasis in male type 2 diabetes patients

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**Background** The relationship between vitamin D (VD) and glucose metabolism is conflicting among recent studies, and whether osteocalcin (OC) makes a mediating difference in this process is still unknown. Thus, we aimed to investigate the mediating role of OC in the link between VD and glucose metabolism in male patients with type 2 diabetes.

**Methods** A total of 1,066 male patients with type 2 diabetes admitted to the Department of Endocrinology at Xinhua Hospital from June 2016 to July 2019 were recruited in this cross-sectional study. Duration of diabetes, age, height, weight, glycosylated hemoglobin A1C (HbA1c), fasting blood glucose (FBG), and fasting insulin (FINS), 25(OH)D and OC at admission were collected from medical records. Analysis of mediating effect was performed to assess the mediating effects of OC on the relationship between VD and glucose metabolism.

**Results** Among the patients, the prevalence of severe vitamin D deficiency, moderate vitamin D insufficiency, and vitamin D non-deficiency was 13.23%, 51.69%, and 35.08%, respectively. With the increase of VD levels, all markers of glucose metabolism all showed a gradually decreasing trend ( $P < 0.05$ ). Multiple linear regression analysis and mediating effect analysis revealed that VD regulated HbA1c and FBG (both  $P < 0.05$ ) directly, while OC played a mediating role in the link between VD and HbA1c and FBG, but not FINS, HOMA-IR and HOMA- $\beta$ .

**Key words** type 2 diabetes, vitamin D, osteocalcin, glucose homeostasis, male

# 慢性阻塞性肺疾病合并肿瘤患者在体组成与血脂的相关研究

## Association between Body Composition and Lipid Profile in Patients with Chronic Obstructive Pulmonary Disease Concurrent Tumors

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**Objective:** This study aims to analyze the variations in body composition and lipid levels among patients suffering from chronic obstructive pulmonary disease (COPD) along with tumors.

**Methods:** We enrolled 95 male patients with COPD who attended our hospital and divided them into three groups according to the Nutritional Risk Screening 2002 (NRS2002) and whether they had respiratory tumor disease: COPD without nutritional risk (COPD+NNR group, N=21), COPD with nutritional risk (COPD+NR group, N=56), and COPD with both nutritional risk and respiratory tumor disease (COPD+NR +CA group, N=18).

**Results:** Statistical analysis showed significant differences in body weight (BW), body fat (BF), percentage body fat (PBF), whole body phase angle (PhA), low-density lipoprotein (LDL), and triglycerides (TG) between the three groups (all  $P < 0.05$ ). We found a negative correlation between BW, BF, PBF, PhA, and TG levels and patients with higher NRS2002 scores in the COPD+NNR and COPD+NR groups ( $r=-0.492$ ,  $r=-0.407$ ,  $r=-0.303$ ,  $r=-0.398$ ,  $r=-0.329$ , all  $P < 0.05$ ). Regression analysis revealed that PhA was an independent protective factor for patients at risk of malnutrition ( $P=0.019$ ,  $OR=0.224$ ). Additionally, a positive correlation was found between BW, PBF, and BF and patients with oncological disease in the COPD+NR and COPD+NR+CA groups ( $r=0.270$ ,  $r=0.232$ ,  $r=0.268$ , all  $P<0.05$ ). Regression analysis found that PhA was an independent risk factor for patients with tumors ( $P=0.028$ ,  $OR=2.773$ ).

**Conclusion:** COPD+NR had the poorest nutritional status among the three groups, with lower BW, BF, PhA, and TG, which increased nutritional risk. Increasing PhA, however, was associated with a lower probability of nutritional deficiency, but an increased risk of tumor development. To support this finding, a larger sample size is needed.

**Key words** chronic obstructive pulmonary disease, tumor, body composition, lipids

# 素食者与杂食者的膳食炎症指数和血清炎症标志物比较

## Comparison of dietary inflammatory index and serum inflammatory markers between vegetarians and omnivores in Chinese population

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**BACKGROUND:** Most previous studies on the association between vegetarian diet and inflammation have used only one inflammatory factor e.g. C-reactive protein(CRP) and the findings were generally inconsistent. This study aimed to investigate the correlation between diet and inflammation in Chinese vegetarians using dietary indices and multiple inflammatory markers.

**METHODS:** 279 vegetarians and omnivores of the same sex and age recruited in Shanghai, 2016. 24-hour dietary review questionnaire were collected and used to calculate Dietary inflammatory index (DII) and Energy-adjusted inflammatory index (EDII) of both groups. In addition, energy intake matched vegetarian and omnivore recipes were designed and used to calculate a theoretical DII. The theoretical DIIs were also compared between groups to provide a theoretical basis for the anti-inflammatory potential of vegetarian diets. Five serum inflammatory markers CRP, interleukin-6 (IL-6), tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), neutrophil-lymphocyte ratio (NLR), and platelet-lymphocyte ratio (PLR) were measured.

**RESULTS:** (i) Vegetarians had significantly lower E-DII and theoretical DII than omnivores ( $2.43 \pm 1.04$  vs.  $2.88 \pm 0.95$ ,  $P < 0.001$ ). (ii) In contrast, the raw DII of vegetarians was not significantly different from that of omnivores, probably due to lower energy intake in vegetarians than in omnivores ( $1367.97 \pm 479.75$  vs.  $1724.78 \pm 568.13$ ,  $P < 0.001$ ). (iii) CRP was lower in vegetarians than in omnivores ( $P = 0.001$ ) though four other inflammatory biomarkers (NLR, PLR, TNF- $\alpha$ , and IL-6) were significantly higher in the vegetarians ( $P < 0.05$ )

**CONCLUSION:** A theoretical vegetarian diet with adequate energy intake as well as a balanced dietary intake showed good anti-inflammatory effects, though this was not fully reflected in the existing vegetarian population in this study, probably due to insufficient energy intake in the vegetarian population.

**Key words** vegetarian; dietary inflammatory index; inflammatory biomarkers

# **修正营养不良诊断后住院患者 DRG 付费补偿与 CMI 的比较**

## **Comparison of DRG based reimbursement and CMI within hospitalized patients before and after modified malnutrition diagnosis**

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**Background & aims:** Malnutrition was often underappreciated in clinical practice. Lack of professional and accurate diagnosis of malnutrition results in the reduction of Diagnosis Related Group (DRG) payment and the decrease of Case-Mix Index (CMI). The aim of this study was to explore the effects of adding proper nutritional diagnosis and modifying complication groups on the compensation of DRG and CMI.

**Methods:** Retrospective analysis was performed on patients admitted to hospital from January to June 2022 who had undergone nutritional assessment. According to the results of patient-generated subjective global assessment (PG-SGA) within 24 hours of admission, the patients were diagnosed with well nourished, mild malnutrition, moderate malnutrition or severe malnutrition. CMI and DRG hospital internal control standard were recalculated and compared with the original values.

**Results:** A total of 254 patients were enrolled, including 40 patients with mild malnutrition, 74 patients with moderate malnutrition, 122 patients with severe malnutrition. Among all subjects, 111 changed complication groups. The median of DRG hospital internal control standard (12006.09 vs. 13797.19,  $p = 0.01$ ) and the median of CMI (0.91 vs. 1.04,  $p = 0.026$ ) were significantly higher than those before modification of diagnosis. For inflammatory bowel disease (IBD) patients, the CMI value, hospital control standard of DRG and the classification of DRG were significantly different compared with those before revision of diagnosis ( $p < 0.001$ ).

**Conclusion:** Fully identification and correctly codification of malnutrition cases are conducive for hospitals to receive proper DRG compensation, and further contribute to the improvement of medical quality and the economic sustainability of hospitals.

**Key words** Malnutrition; DRG; CMI; PG-SGA

## 肌肉减少症的特殊膳食模式：中国 1059 名社区居民的横断面研究结果

### Association of Dietary Patterns and Sarcopenia: a cross-sectional study of 1059 participants in China

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**Background:** Sarcopenia, defined as the loss of muscle mass and strength, has been associated with increased hospitalization and mortality. Dietary pattern analysis is a whole diet approach used to investigate the relationship between diet and sarcopenia. This study aims to estimate the prevalence of sarcopenia and explore possible factors associated with it among a large population in Beijing, China.

**Methods:** A cross-sectional study with 1059 participants aged more than 50 years was performed. Sarcopenia was defined based on the guidelines of the Asian Working Group for Sarcopenia. The total score of the MNA-SF questionnaire was used to analyse nutrition status. The baseline demographic information, diet structure and eating habits were collected by clinicians trained in questionnaire data collection and anthropometric and bioimpedance measurements.

**Results:** The overall prevalence of sarcopenia was 8.8% and increased with age: 5%, 5.8%, 10.3% and 26.2% in the 50–59, 60–69, 70–79, and  $\geq 80$  years groups, respectively. Marital status (with or without a spouse) was not an independent factor associated with sarcopenia or income status. However, nutritional risk or malnutrition, vegetable diet, advanced age and spicy eating habits were risk factors for sarcopenia. Meanwhile, daily fruit, dairy and nut consumption were protective factors against sarcopenia.

**Conclusions:** Although further studies are required to explore the association between healthy dietary patterns and the risk of sarcopenia, the present study provides basic data for establishing dietary guidelines for the prevention of sarcopenia in elderly Chinese individuals.

**Key words** sarcopenia; prevalence; dietary patterns; older adults

# 口服肿瘤营养补充监测通过调节白介素对肠胃道癌症术后患者营养状态和体重指数及骨骼肌的影响

## Effect of post-discharge oral nutritional supplement on BMI and skeletal muscle mass through interleukin group in malnourished patients with gastrointestinal cancer

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### Background and Objectives

Gastrointestinal cancer (GI) patients often suffer from malnutrition after surgery, especially for those post-discharge ones. Most studies focused on oral nutrition supplement (ONS) for clinical outcomes in patients during hospital stay. This study was to investigate the impact of tumor-specialized ONS (TSONS) on BMI and skeletal muscle mass (SMM) in post-discharge malnourished GI patients after surgery through interleukin (IL) group.

### Methods

A retrospective study was delivered in a real-life clinical setting. GI adults at risk of malnutrition after surgery from December 2021 to October 2022 were recommended to receive hospital-prepared TSONS, containing 18% protein, 50.0% fat and 32.0% carbohydrate per service, to reach 500 kcal per day up to 3 weeks. Nutritional status was evaluated by Scored Patient-Generated Subjective Global Assessment. Generalized Linear Mixed Models (GLMM) was used with subject fix effects to analyze the effects on BMI and SMM.

### Results

In total, 42 eligible GI patients receiving three-week TSONS were included in this analysis. Three-week TSONS improved nutritional status ( $P < 0.001$ ). After stratified by the status of body weight and appendicular skeletal muscle index (ASMI), underweight or low ASMI patients gained better nutrition status than other counterparts. Regarding IL factors, the median values got slightly increased in patients with normal weight and overweight, and normal ASMI, compared to those with underweight or low ASMI, although no significance was found. GLMM showed that IL2 and IL10 were positively associated with SSM ( $\beta = 2.1$ ,  $P = 0.019$ ) and BMI ( $\beta = 1.3$ ,  $P = 0.002$ ), respectively, while IL4 was negatively associated with BMI ( $\beta = -1.6$ ,  $P = 0.012$ ).

### Conclusion

Three-week TSONS improved nutritional status in malnourished GI patients after surgery. Three-week TSONS could affect IL group to increase BMI and SSM. In the future, RCT with longer TSONS period is required to investigate the impacts of IL groups on BMI and SSM.

**Key words** malnutrition, body mass index, sarcopenia, skeletal muscle mass, interleukin, oral nutritional supplements; gastrointestinal cancer

# 乳腺癌化疗患者膳食营养行为及影响因素：一项基于健康行为改变整合理论的多中心调查研究

## The Dietary Nutritional Practice of Breast Cancer Patients Receiving Chemotherapy and its Associated Factors: A Multicenter Survey from Hospitals in China Based on the Integrated Theory of Health Behavior Change

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*Background and Objectives:* Chemotherapy often disturbs breast cancer patients' nutritional status, and females need to conduct active dietary nutritional practice to maintain healthy dietary habits and normal nutritional status. With the guidance of the 'Integrated Theory of Health Behavior Change', the objective of this survey is to determine the level and associated factors of patients' dietary nutritional practice from the perspective of health self-management.

*Methods and Study Design:* This was a multicenter cross-sectional study. A total of 396 breast cancer patients undergoing chemotherapy were included from three hospitals spanning three cities in China. Face-to-face investigations were conducted using the Questionnaire of demographic and clinical characteristics; the Dietary Nutritional Knowledge, Attitude and Practice Questionnaire; a Strategies Used by People to Promote Health; Consideration of Future Consequences Scale-Food; Treatment Self-Regulation Questionnaire and Perceived Social Support Scale.

*Results:* The results showed overall satisfactory dietary nutritional practice with a score of  $37.97 \pm 5.13$ . In the final regression model, patients with higher scores for positive attitude and decision making, future-oriented consequences, friend support, lower scores for amotivation, lower body mass index and average monthly household incomes and cancer stage, had endocrine therapy and higher education level, and lived in the urban area had higher dietary nutritional practice levels (adjusted  $R^2=46.3\%$ ,  $p < 0.001$ ).

*Conclusions:* Targeted nutritional interventions should be designed by health professionals based on females' self-care self-efficacy, consideration of future consequences of food, treatment self-regulation and perceived social support. Female patients who have a higher body mass index and income and cancer stage, live in rural areas, have a lower education level, and without endocrine therapy are the focus population of intervention.

**Key words** behavior; breast cancer; chemotherapy; diet; nutrition

# 基于体重下降和炎症状态的预后分级系统是晚期恶性肿瘤患者预后判断的有效指标

## A promising prognostic grading system incorporating weight loss and inflammation in patients with advanced cancer

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**Background:** Involuntary weight loss and elevated systemic inflammation are frequently observed in cancer patients with advanced stages. Our objective is to develop a weight loss and inflammation grading system (WLAIGS) and investigate its prognostic performance in patients with advanced cancer.

**Methods:** This multicenter prospective cohort study included 4570 (40.0%) patients in stage III and 6853 (60.0%) patients in stage IV. A  $4 \times 4$  matrix representing four different percent weight loss (WL %) categories within each of the four different neutrophil-to-lymphocyte ratio (NLR) categories was constructed. The WLAIGS consisted of four grades, with hazard ratios (HRs) for overall survival (OS) increasing from grade 1 to grade 4. Comprehensive survival analyses were performed to investigate the association between WLAIGS and OS. The secondary outcomes were short-term survival, malnutrition, and quality of life.

**Results:** We totally recorded 5,046 death cases during the median follow-up of 17.33 months. Kaplan-Meier curve showed survival rate decreased from grade 1 to grade 4 in patients with advanced cancer ( $P < 0.001$ ). The WLAIGS was an independent risk factor associated with OS adjusting for confounders, with HRs increasing from 1.19 (95% Confidence interval (CI), 1.11–1.29;  $P < 0.001$ ) in grade 2, 1.48 (95% CI, 1.37–1.59;  $P < 0.001$ ) in grade 3 to 1.72 (95% CI, 1.57–1.88;  $P < 0.001$ ) in grade 4. A similar survival trend from grade 1 to 4 was observed in lung, upper gastrointestinal, hepatobiliary, pancreatic, and colorectal cancers. In each WL% group ( $2 < \text{WL}\% \leq 6$ ;  $6 < \text{WL}\% \leq 10$ ,  $\text{WL}\% > 10$ ), a NLR above 3 was associated with shorter survival and served as an independent prognostic predictor. The risk of short-term mortality, malnutrition, and poor quality of life increased with WLAIGS grade. Two internal validation cohorts confirmed results of our study.

**Conclusions:** The WLAIGS, which reflects malnutrition and systemic inflammation status, is a robust and convenient tool in predicting the prognosis of patients with advanced cancer.

**Key words** Weight loss; Inflammation; Advanced cancer; Prognosis; Grading system



# 血清营养标志物在肿瘤恶液质患者预后判断中的作用分析

## Comprehensive Evaluation the Prognostic Value of Serum Nutritional Markers in Cancer Patients with Cachexia

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**Background:** Our objective is to comprehensively investigate the prognostic value of three serum nutritional markers including albumin, prealbumin and transferrin in patients with cancer cachexia.

**Methods:** Concordance index and receiver operating characteristic curves were applied to compare the prognostic value of different markers. The primary outcome was overall survival (OS) using the Kaplan-Meier method generated by log-rank test. A Cox proportional hazard regression model was used to identify independent predictors associated with OS. The second outcomes included short-term survival and quality of life.

**Results:** This multicenter prospective cohort study included 1303 patients with cancer cachexia, with 592 death cases during a median follow-up of 20.23 months. Albumin was the most accurate predictor for survival, followed by transferrin and prealbumin. Kaplan-Meier curves showed patients with low albumin, prealbumin, or transferrin had significantly shortened OS. Multivariate Cox regression analysis showed low albumin (hazard ratio = 1.55, 95% confidence interval = 1.31-1.84,  $P < 0.001$ ), prealbumin (HR = 1.33, 95%CI = 1.11-1.59,  $P = 0.002$ ), and transferrin (HR = 1.46, 95%CI = 1.22-1.74,  $P < 0.001$ ) were independent risk factors for prognosis in cancer patients with cachexia. The prognostic value of low albumin was significant in patients with upper gastrointestinal, hepatobiliary and pancreatic and colorectal cancers; low prealbumin was significant in colorectal cancer; and low transferrin was significant in patients with upper gastrointestinal and colorectal cancer. All three nutritional markers were valuable in predicting survival for patients in advanced stage. The risks of short-term mortality and poor quality of life were significantly increased in patients with low albumin, prealbumin, and transferrin.

**Conclusion:** Low albumin, prealbumin, and transferrin negatively affect prognosis of patients with cancer cachexia, especially in advanced stages. Our results highlight the significance of routinely checking serum nutritional markers to early predict the prognosis of patients with cancer cachexia.

**Key words** Albumin; Prealbumin; Transferrin; Cancer Cachexia; Prognosis

# 基于 BMI 的炎症指数是老年肿瘤患者的预后判断指标

## Body Mass Index–Based Inflammation Index is a Promising Prognostic Predictor in Older Adult Cancer Patients

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**Backgrounds:** Older patients with cancer are often encountered with decreased immune responses, chronic inflammation status, and malnutrition. The present study aimed to develop a novel body mass index (BMI)-based inflammation index for older patients with cancer.

**Methods:** Concordance index and receiver operating characteristic curves were applied to compare the prognostic value of various BMI-based inflammation indices. The overall survival (OS) was calculated using the Kaplan–Meier method generated by the log-rank test. A Cox proportional hazard regression model was performed to identify independent predictors associated with OS. The second outcomes included short-term survival, malnutrition and cachexia.

**Results:** This multicenter prospective study totally included 2376 older patients with cancer, with 1112 death cases during a median follow-up of 17.43 months. BMI to C-reactive protein/lymphocyte ratio (BCLR) was the most accurate index in predicting survival. A low BCLR was significantly associated with shortened OS and served as an independent risk factor for survival in older patients with cancer (hazard ratio[HR]=1.51, 95% confidence interval[CI]=1.32–1.73,  $P<0.001$ ). In the subgroup analysis, a low BCLR was an unfavorable factor negatively affecting survival in older patients with lung (HR=1.40, 95%CI=1.13–1.73,  $P=0.002$ ), upper gastrointestinal (HR=1.32, 95%CI=1.01–1.73,  $P=0.041$ ), hepatobiliary and pancreatic (HR=1.78, 95%CI=1.10–2.88,  $P=0.020$ ) and colorectal cancer (HR=2.24, 95%CI=1.57–3.18,  $P<0.001$ ). In addition, the prognostic value of low BCLR was significantly in underweight, normal as well as overweight and obesity populations. Multivariate logistic regression models showed that a low BCLR independently increased the risk of short-term mortality, malnutrition and cancer cachexia in older patients with cancer. Two internal validation cohorts at a ratio of 7:3 confirmed the results of our study.

**Conclusion:** The BCLR is a promising indicator to assess nutritional-inflammatory status in older patients with cancer and can be used to identify patients with worse prognoses in the clinical practice.

**Key words** Body mass index; Inflammation; Cancer; Older patients; Prognosis

# 改良的控制营养状态 (CONUT) 评分是肿瘤恶液质患者预后判断的有效指标

## Modified Controlling Nutritional Status (mCONUT) serves as a promising prognostic scoring system in patients with cancer cachexia

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**Backgrounds:** Malnutrition and systemic inflammation are considered as two hallmarks of cancer cachexia. Our objective is to construct a modified Controlling Nutritional Status (mCONUT) by introducing C-reactive protein (CRP) as an inflammatory parameter and investigate its prognostic value in patients with cancer cachexia.

**Methods:** This multicenter cohort study included 5221 patients with cancer, among whom 1719 were diagnosed with cachexia. We set three optimal cut-off values for CRP to construct a four-scale mCONUT scoring system. Patients were divided into low and high CONUT/mCONUT groups, with cut-off scores of 5 and 7, respectively. Concordance index and receiver operating characteristic curves were used to compare prognostic values between two systems. The primary outcome was overall survival (OS) and comprehensive survival analyses were performed. The secondary outcomes were short-term survival, malnutrition, and quality of life.

**Results:** During the median follow-up of 17.47 months, 813 deaths were recorded. The mCONUT was more accurate than CONUT in predicting survival in patients with cancer cachexia. Patients in the high CONUT/mCONUT group had a significantly shorter OS. Multivariate Cox analysis confirmed high CONUT (hazard ratio [HR] =1.34, 95% confidence interval [CI] =1.13 - 1.58,  $P < 0.001$ ) and mCONUT (HR=1.46, 95% CI=1.26 - 1.69,  $P < 0.001$ ) were independent risk factors for survival adjusting for confounders. In subgroup analyses, a high mCONUT score had a significantly negative effect on survival in cachexia patients with upper gastrointestinal (HR=1.71, 95% CI=1.32 - 2.22,  $P < 0.001$ ) and colorectal (HR=2.63, 95% CI=1.77 - 3.90,  $P < 0.001$ ) cancer, especially for advanced stage patients. The risk of short-term mortality and experiencing malnutrition rose to 2.17 (95% CI=1.48 - 3.20,  $P < 0.001$ ) and 1.92 (95% CI=1.13 - 3.47,  $P = 0.022$ ) times, respectively, in the high mCONUT group, as well as with poorer life quality. Two internal validation cohorts confirmed results of our study.

**Conclusion:** mCONUT comprehensively reflects nutritional, immune, and inflammatory status and serves as a powerful prognostic factor in patients with cancer cachexia.

**Key words** Controlling Nutritional Status; Systemic inflammation; C-reactive protein; Cancer Cachexia; Prognosis

# 北京市视网膜动脉硬化患病率及营养代谢相关危险因素 Prevalence of retinal arteriosclerosis and nutritional metabolism associated risk factors in Beijing city, China

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## Abstract

**Aims:** To estimate the prevalence of retinal arteriosclerosis (RA), and to explore potential nutritional metabolism risk factors of RA in people of Beijing city the capital of China.

**Methods:** Examine physical and biochemical parameters to the general population in health examination institutions in 2020, include total of 17130 subjects (10613 men and 6517 women). RA was diagnosed according to the results of a funduscopy examination performed by expert ophthalmologists. Diagnosis of metabolic syndrome (MS) was based on the IDF (2016) definitions for the Chinese people standard, type 2 diabetes mellitus (DM2) and coronary heart disease (CHD) diagnosis was according to patients' memory with exact diagnostic time in a self-administered questionnaire. Univariate and multivariate Logistic regression analyses were conducted to evaluate the demographic and clinical factors associated with retinal arterial atherosclerosis

**Results:** The prevalence of RA was 19.74% in male and 12.15% in female respectively. Multiple logistic regression analysis shows, the multivariate-adjusted odds ratio of age was 1.111 (95%CI: 1.106~1.116), waist circumference (WC) was 1.009 (95%CI: 1.003~1.014), body mass index (BMI) was 1.046 (95%CI: 1.026~1.067), systolic blood pressure was 1.013 (95%CI: 1.010~1.015), fasting plasma glucose (FPG) was 1.066 (95%CI: 1.031~1.102), white blood cell counts (WBC) was 1.046 (95%CI: 1.014~1.079), serum uric acid (UA) was 1.002 (95%CI: 1.001~1.002), DM2 was 1.593 (95%CI: 1.372~1.851), MS was 1.203 (95%CI: 1.062~1.361), smoking index was 1.000 (95%CI: 1.000~1.001). The areas under ROC curves show that age, WC, FPG, SBP have the greater ability to discriminate RA than others.

**Conclusion:** These results indicate that RA in people of Beijing city had a higher prevalence than national averages. Age, SBP, FPG, WC, DM2, MS, WBC, BMI, UA were all nutritional metabolism risk factors for RA.

**Key words** retinal arteriosclerosis, general population, nutritional metabolism, risk factors

## 基于 GLIM 标准的三种营养诊断工具对肝胆胰肿瘤患者营养不良评价比较

### Comparison of GLIM, PG-SGA and PNI in diagnosing malnutrition among patients with hepatobiliary-pancreatic tumors

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**Objective:** To compare the diagnostic value of three tools—the Global Leadership Initiative on Malnutrition (GLIM) criteria, patient-generated subjective global assessment (PG-SGA), and prognostic nutritional index (PNI) in malnutrition among hospitalized patients with hepatobiliary-pancreatic tumors. Meanwhile, to observe the nutritional intervention of these patients.

**Methods:** Present study was a cross-sectional study, including 378 hospitalized patients with hepatobiliary-pancreatic tumors between December 2021 and July 2022 at Ningbo Medical Center Lihuili Hospital, China. The incidence rate of malnutrition was diagnosed using the three tools. The consistency of the three tools was analyzed by Cohen's kappa statistic. Data, including nutritional characteristics and nutritional interventions, were collected. The nutritional intervention was observed according to the principles of Five Steps Nutritional Treatment.

**Results:** ① The incidence of nutritional risk was 43.65% (165/378) among these patients. The prevalence was 36.24%, 36.77%, and 55.82%, as diagnosed by the GLIM, PG-SGA, and PNI, respectively. The diagnostic concordance of PG-SGA and GLIM was higher (Kappa = 0.772,  $P < 0.001$ ) than PNI vs. GLIM (Kappa = 0.258,  $P < 0.001$ ).

② Univariate analysis revealed that older age and lower BMI were significant associated with nutritional risk and malnutrition. ③ Among 165 patients with nutritional risk, only 56 cases received nutritional support. Most of patients (109/165, 66.06%) did not meet the nutritional support standard.

**Conclusion:** The incidence of nutritional risk and malnutrition is high among hospitalized patients with hepatobiliary-pancreatic tumors. The GLIM showed the lowest prevalence of malnutrition among the three tools. The PG-SGA and GLIM had a relative high level of agreement. There was a low proportion of nutritional support in patients. More prospective and well-designed cohort studies are needed to confirm the relevance of GLIM criteria in clinical practice in the future.

**Key words** GLIM, PG-SGA, PNI, malnutrition, hepatobiliary-pancreatic tumors, hospitalized patients

Category: Clinical Nutrition

# 基于患者参与框架改善门诊头颈部肿瘤放疗患者营养状况的应用研究

## Application of Patient Engagement Framework in improving nutritional status of outpatients with head and neck cancer undergoing radiotherapy

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**Object** The purpose of this study is to explore the effect of applying the 'patient participation framework' to outpatients with head and neck cancer radiotherapy.

**Methods** According to the start time of the first radiotherapy, the patients were divided into intervention group and control group. The patients in the control group were treated with routine nursing measures. On the basis of routine nursing measures, the patients in the intervention group were allowed to actively participate in symptom management through the patient participation framework and electronic information platform. Doctors, nurses and patients worked together to carry out individualized symptom guidance and intervention. Radiation-induced oral mucositis, nutritional status and other radiotherapy-related adverse reactions were evaluated at 4 and 7 weeks of radiotherapy.

**Results** A total of 67 patients were included. The occurrence time of radioactive oral mucositis in the intervention group was later than that in the control group, and the incidence of moderate to severe radioactive oral mucositis was significantly lower than that in the control group ( $P < 0.05$ ). Weight and Body Mass Index loss in the control group were more significant than those in the intervention group at weeks 4 and 7 after RT ( $P < 0.05$ ). The loss of albumin and hemoglobin decreased more significantly in the control group at week 7 after RT than that in the intervention group ( $P < 0.05$ ), but the differences were not significant at week 4 after RT. There were significant differences between the intervention group and control group in the terms of adverse reactions, including moderate-severe pain, nausea, vomiting.

**Conclusion** Through electronic information means, patients can actively participate in nutrition management, doctors, nurses and patients work together to carry out individualized nutrition guidance and nutrition intervention, which can effectively improve the nutritional status of patients and reduce the incidence of radiotherapy-related adverse reactions.

**Key words** Patient Engagement Framework; outpatient; radiotherapy; nutritional status

Category: Clinical Nutrition

# 炎症性肠病住院患者营养状况的评价及与疾病进展的相关性研究

## Evaluation of nutritional status of inpatients with inflammatory bowel disease and its correlation with disease progression

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**Objective:** This study evaluates the nutritional status of patients with inflammatory bowel disease, investigates the association of nutritional status and disease progression, and analysis the influence factors of inflammatory bowel disease patients with nutritional risk.

**Methods:** 125 patients with inflammatory bowel disease from October 2020 to October 2021 in the Grade A Hospital in Shenyang were selected. According to nutritional risk screening 2002, all patients were divided into nutritional and non-nutritional risk groups.

**Results:** The average age of subjects was  $37 \pm 27$  years old, and the number of males was higher than that of females. Compared with the non-nutritional risk group, patients with perianal lesions and disease activity in the mild, moderate, severe stages, C-reactive protein and incidence of disease complications were higher in the nutritional risk group, and the number of patients in the body composition index, remission stage, albumin, transferrin, retinol-binding protein, hemoglobin, etc. were lower ( $P < 0.05$ ). The incidence of inflammatory bowel disease combined with hypoproteinemia was 36.8%, anemia 56.8%, sarcopenia 23.2%, and inflammatory infection 52.0%. In regression analysis, the possibility of nutritional risk in the disease active stage was 2.486 times higher than that in the remission stage; For each 1-unit reduction in Body mass index, the risk of developing nutritional risk increased by 63.9%. The nutritional risk was positively correlated with disease activity ( $r_s = 0.384$ ); Albumin, retinol-binding protein, hemoglobin, body mass index, body fat, bone mineral content, skeletal muscle content, basal metabolic rate, etc. were negatively correlated with disease activity.

**Conclusions:** Poor nutritional status of patients with inflammatory bowel disease; The body composition index, nutritional risk, albumin, retinol-binding protein, and hemoglobin affected the progression of inflammatory bowel disease. Disease activity was a risk factor for nutritional risk, and body mass index is a protective factor.

**Key words** Inflammatory bowel disease; Nutritional assessment; Nutritional risk screening 2002; Body composition; Nutritional risk;

# 头颈癌患者围手术期的营养状况及体成分的研究

## Nutritional status and body composition in perioperative patients with head and neck cancer

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**Background** We aimed to describe nutrition status and body composition profile in pre- and post-operative head and neck cancer (HNC) patients managed by the evidence-based whole-course nutritional support.

**Methods** This work is a prospective cohort study of patients who were newly diagnosed HNC and would underwent operation. Nutrition assessment, which included Scored Nutritional Risk Screening (NRS 2002) and Patient-Generated Subjective Global Assessment (PG-SGA), and body composition were conducted initially before surgery and recorded after surgery.

**Results** A total of 96 surgery patients with HNC were included. According to the preoperational SMM, all patients, of which 10 patients were missed, were divided into high SMI (N=43) and low SMI groups (N=42). (1) The NRS 2002 postoperative were higher than that on admission ( $p<0.01$ ), and the PG-SGA were higher after surgery 2 weeks than 0 days ( $p<0.01$ ). No matter pre- and post-operatively, there were significantly higher scores in low SMI group, both preoperatively (NRS 2002:  $p=0.01$ ) and 0 days (NRS 2002:  $p=0.008$ , PG-SGA:  $p=0.006$ ), 2 weeks postoperatively (PG-SGA:  $p=0.036$ ). (2) There were significantly greater weight and BMI decline in high SMI group ( $\Delta\text{BMI}$ :  $p=0.034$ ,  $\Delta\text{weight}$ :  $p=0.046$ ). (3) Three post-operative serum nutritional indicators, include albumin, prealbumin and PNI, were lower than that preoperatively, but the values after 2 weeks were raised than that after surgery 1week (all  $p<0.01$ ). There was no statistical difference for the prealbumin preoperative and that postoperative 2 weeks. (4) The negative correlation of SMM loss and prealbumin was observed ( $r=-0.255$ ,  $p=0.029$ ). Preoperative BMI ( $p<0.01$ ), tumor differentiation ( $p=0.003$ ) and nutritional risk ( $p=0.049$ ) were the risk factors for weight loss.

**Conclusions** For HNC perioperative patients, fat and skeletal muscle mass were both declined, and the loss of adipose tissue was earlier than the muscle. Except for preoperative BMI, prealbumin should be taken into account as an indicator for nutritional status in clinical practice.

**Key words** Head and neck cancer; HNC; Nutrition status; body composition; weight loss



## 多学科营养管理改善食管癌放化疗患者的营养指标和住院结局： 一项随机对照试验

### Multidisciplinary nutritional management improves nutritional and hospitalized outcomes of patients with esophageal cancer undergoing chemoradiotherapy: A randomized control trial

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**Introduction:** This study aimed to investigate the effects of multidisciplinary whole-course nutrition management on nutritional status and complications during the course of treatment in patients with esophageal cancer (EC) undergoing chemoradiotherapy.

**Materials and Methods:** A total of 36 EC patients undergoing chemoradiotherapy were randomly divided into a control group (n=18) and an intervention group (n=18). Participants in the control group were given routine nutritional support, whereas patients in the intervention group were provided with whole-course nutrition management from the Nutrition Support Team (NST). Nutrition-related indicators, i.e., serum albumin level (ALB), hemoglobin (Hb), and C reactive protein (CRP) were assessed before, during and after treatment in both groups. The incidence of complications (e.g., lymphocytopenia, radiation esophagitis, and myelosuppression), clinical outcomes, length of hospital stay, and hospital costs were also recorded. Differences between the two groups were tested using the Mann-Whitney U test and chi-square test.

**Results:** The ALB and Hb levels of the patients in the control group decreased (ALB: -2.6 (-5.6, 0), p=0.01; Hb: -12.0 (-27.0, -2.0), p=0.04) and CRP increased (8.9 (2.9, 14.9), p=0.02) significantly compared to those before treatment, while the indicators of participants in the intervention group did not change (p>0.05). The incidence of grade  $\geq$  II lymphocytopenia was higher in the control group than that in the intervention group (33.3% vs 61.1%, p=0.03). Moreover, compared with the control group, the average lengths of hospital stay were decreased by 12 days (47 (40, 50) vs 35 (23, 40), p=0.001), and the in-patient expenses were decreased by 20,504 CNY in the intervention group (p=0.004).

**Conclusion:** Multidisciplinary whole-course nutrition management would maintain the nutritional status of EC patients undergoing chemoradiotherapy. It might lower the incidence of complications, shorten the hospital stays and reduce the in-patient expenses.

**Key words** nutrition management, esophageal cancer, chemoradiotherapy, nutritional status, complication

# 鼻饲管喂养对食管癌患者营养状况和生活质量的影响：一项回顾性研究

## Nasogastric tube feeding improves nutritional status and physical state in esophageal cancer patients during chemoradiotherapy: A retrospective study

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**Objective** To compare the complication rates, nutritional status, and physical state between esophageal cancer (EC) patients managed by nasogastric tube (NGT) feeding versus those managed by oral nutritional supplementation (ONS) during chemoradiotherapy.

**Methods** EC patients undergoing chemoradiotherapy managed by non-intravenous nutritional support in our institute were retrospectively recruited and divided into an NGT group and an ONS group based on the nutritional support method. The main outcomes, including complications, nutritional status, and physical state, were compared between groups.

**Results** The baseline characteristics of EC patients were comparable. There were no significant differences in the incidence of treatment interruption (13.04% vs. 14.71%,  $P = 0.82$ ), death (2.17% vs. 0.00%,  $P = 0.84$ ) or esophageal fistula (2.17% vs. 1.47%,  $P = 1.00$ ) between the NGT group and ONS group. Body weight loss and albumin loss were significantly lower in the NGT group than in the ONS group (both  $P < 0.05$ ). EC patients in the NGT group had significantly lower Nutritional Risk Screening 2002 (NRS2002) and Patient-Generated Subjective Global Assessment (PG-SGA) scores and significantly higher Karnofsky Performance Status (KPS) scores than patients in the ONS group (all  $P < 0.05$ ). The rates of grade  $>2$  esophagitis (10.00% vs. 27.59%,  $P = 0.03$ ) and grade  $>2$  bone marrow suppression (10.00% vs. 32.76%,  $P = 0.01$ ) were significantly lower in the NGT group than in the ONS group. There were no significant differences in the incidence of infection and upper gastrointestinal disorders or therapeutic efficacy between groups (all  $P > 0.05$ ).

**Conclusions** EN through NGT feeding leads to significantly better nutritional status and physical state in EC patients during chemoradiotherapy than EN via ONS. NGT may also prevent myelosuppression and esophagitis.

**Key words** Esophageal cancer; malnutrition; nasogastric tube feeding; physical state

# **GLIM 营养不良诊断标准在中老年内科住院患者中的应用**

## **GLIM criteria-defined malnutrition informs on clinical and financial implications for middle-aged and elderly inpatients**

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**Objective:** Malnutrition, a common diagnosis among elderly patients, can lead to a more complex hospitalization process with an increased length of stay and higher cost. Studies regarding malnutrition in inpatients using the Global Leadership Initiative in Malnutrition (GLIM) criteria are still limited. The aim of this study is to analyze clinical and financial implications among middle-aged and elderly inpatients with GLIM-defined malnutrition.

**Methods:** This study retrospectively collected the data of the electronic medical records of patients who were aged  $\geq 40$  years and newly hospitalized at the internal medicine departments in a Guangzhou academic hospital between January and February 2021. Patients who were bed-bound on admission, with terminal stage of disease, hospitalized less than 24 hours, and/or didn't accept diagnosis and treatment were excluded. Nutritional assessment using the GLIM criteria was conducted within the first 24 hours of admission. The variables recorded included demographic, anthropometric, clinical and hospitalization data. Logistic regression was used to assess the odd ratios [95% confidence intervals, OR(95%CI)] of anemia (hemoglobin  $< 120\text{g/L}$  for male and  $< 110\text{g/L}$  for female), hypoalbuminemia (albumin  $< 30\text{g/L}$ ), hypoprealbuminemia (prealbumin  $< 0.20\text{g/L}$ ) and hypotransferrinemia (transferrin  $< 2.00\text{g/L}$ ). In the fully adjusted model, age, sex and medicine department were adjusted.

**Result:** A total of 1289 inpatients [aged 64 (56-71) years, 53.5% male] were included in this study. According to the GLIM criteria, 374 inpatients (29.7%) were malnourished. For malnourished patients, the median stay of hospitalization was 29% longer [9 (7-13) vs. 7 (5-10) days,  $p < 0.001$ ] and the median expenses was 28% higher [total cost, 15631 (10050-30894) vs. 12213 (8192-28338) yuan,  $p < 0.001$ ; medicine cost, 3412 (1526-7423) vs. 1479 (718-3348) yuan,  $p < 0.001$ ]. They also had higher risk for anemia [adjusted OR(95%CI), 2.63 (2.00-3.49)], hypoalbuminemia [adjusted OR(95%CI), 3.04 (2.05-4.53)], hypoprealbuminemia [adjusted OR(95%CI), 2.79 (1.85-4.21)], and hypotransferrinemia [adjusted OR(95%CI), 2.11 (1.55-2.89)].

**Conclusions:** Malnutrition according to the GLIM criteria is common in middle-aged and elderly patients and lead to poorer hospitalization outcomes, longer stay, and higher expenses.

**Key words** malnutrition; GLIM; albumin; hospital expenses; length of hospital stay

# 新诊断胰腺癌患者体重变化与血小板淋巴细胞比值相关关系

## Platelet to lymphocyte ratio differences in newly diagnosed pancreatic cancer patients' weight loss trajectories: the role of inflammation

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**Background:** Unintentional weight loss is a common symptoms of pancreatic cancer, associating with systemic inflammation and affecting treatment, survival outcomes, and quality of life. The platelet to lymphocyte ratio (PLR) is a marker of systemic inflammation and was proven to be associated with poor outcomes in many cancer patients. The aim of this study is to determine the role of PLR in weight loss in patients with pancreatic cancer.

**Methods:** This study retrospectively collected the data from electronic medical records of an academic hospital in Guangzhou. Patients newly diagnosed pancreatic cancer and hospitalized between 2019 and 2021 were included. Those who were bed-bound on first admission, with terminal stage of cancer, or with less than twice readmission during the following 12-month period were excluded. Demographic (age, sex, current smoking status, regular drinking status), disease specific variables (TMN stage, treatment parameters), as well as dietary energy intake, weight and blood cells parameters during 12-month follow up period were assessed. Trajectory analyses were performed to identify distinct subgroups that share similar course of changes of weight.

**Results:** A total of 136 patients with pancreatic cancer [aged  $58.7 \pm 10.1$  years, 58.1% male] were included in this study. Participants have a median of 6(3-9) monthly records across a 7(4-12) months span. Based on records over the follow-up period, two weight trajectories were identified: stable pattern [weight loss, 3.3(0-6.6)%, n=79, 58.1%] and decreasing pattern [weight loss, 14.3(11.3-19.4)%, n=57, 41.9%]. The patients with decreasing weight pattern tended to be younger (aged  $56.3 \pm 11.1$  vs.  $60.4 \pm 9.1$  years,  $p=0.020$ ), with lower baseline lymphocyte counts [ $1.27(1.07-1.55)$  vs.  $1.56(1.19-1.95)$ ,  $p=0.007$ ] and higher baseline PLR [ $203(155-239)$  vs.  $154(114-238)$ ,  $p=0.024$ ].

**Conclusion:** An elevated PLR associated with greater weight loss in patients with pancreatic cancer. Based on these readily-available and routine biomarkers of systemic inflammation we may identify pancreatic cancer patients at risk for excessive weight loss.

**Key words** weight loss; trajectory modeling; pancreatic cancer; platelet to lymphocyte ratio; lymphocyte

Category: Clinical Nutrition

## 营养因素与克罗恩病肛瘘

### Nutritional factors and anal fistula in Crohn's disease

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**Background and Objectives:** Anal fistula has a high incidence and poor prognosis in patients with Crohn's disease (CD), early detection and treatment can reduce the recurrence. We aimed to investigate risk factors (including nutritional factors) related to anal fistula in CD patients and provide some clues for early screening.

**Methods and study design:** 122 CD patients were enrolled and divided into two groups: with (CD-AF) or without anal fistula (CD) according to the MRI of anal fistula. Data about demography, disease activity, history of surgery, serological indicators, nutritional factors (e.g. BMI, WHR, controlling nutritional status score, sarcopenia, body fat rate, visceral fat rate, phase angle etc.) were collected.

**Results:** CD-AF group had more males, younger age, less body fat, more patients with history of perianal surgery, higher blood hemoglobin and CRP concentration than CD group. There were no difference among factors including Crohn's Disease Activity Index (CDAI) score, other nutritional factors, lesion range and history of intestinal surgery. Logistic regression analysis showed significant differences on female (OR=0.106, 95% CI=0.013-0.862, P=0.036), age (OR=0.941, 95% CI=0.894-0.990, P=0.019), history of perianal surgery (OR=4.250, 95% CI=1.074-16.811, P=0.039).

**Conclusions:** The characteristic of male, younger age and history of perianal surgery may be potential risk factors for anal fistula in CD patients. However, the severity of CD and nutritional factors had no significant effect on the incidence of anal fistula.

**Key words** Crohn's disease; Anal fistula; Nutrition

# 100 个已知和可疑影响因素与总体卵巢癌症风险和 6 种组织类型的潜在因果关系：一项孟德尔随机化研究

## Potential causal associations of 100 known and suspected influencing factors with risk of overall ovarian cancer and six histotypes: A Mendelian randomization study

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**Background:** Observational studies have linked various exposures to ovarian cancer (OC) risk, but the findings are potential subject to reverse causation and confounding. Besides, limited studies have comprehensively investigated these associations by different histotypes. Herein, we performed comprehensive Mendelian randomization (MR) analyses to systematically evaluate potential causal associations of known and suspected influencing factors with risk of OC and six common histotypes. **Methods:** Two-sample MR analyses were applied to data from the genome wide association study summary results comprising a total of 25,509 women with epithelial OC and 40,941 controls of European descent in the Ovarian Cancer Association Consortium. Genetic instrumental variables associated with influencing factors were selected. Inverse-variance weighted method was used as the primary analysis, and the MR assumptions were evaluated in sensitivity analyses. MR-PRESSO method was applied for the detection and correction of potential horizontal pleiotropy. **Results:** OC and six histotypes were considered in this study. Of 100 known and suspected influencing factors, 46 were identified to be related to OC risk. Notably, alcohol drinking, cigarette smoking, chronotype, time spent driving, sugar or poultry or vegetable intake, linoleic acid or saturated fatty acids (FA), age at first birth or at menopause, hysterectomy, several body size factors, endometriosis, schizophrenia, glycoprotein acetyls, and telomere length were significantly positively associated with risk of OC or six histotypes. In contrast, income, past tobacco smoking, time spent using computer, 25 hydroxyvitamin D, cheese or fruit intake, dietary change, omega-3 FA, parity, C-reactive protein, HDL cholesterol, proinsulin levels, testosterone, and tumor necrosis factor were significantly inversely associated with risk of OC or histotypes. **Conclusions:** Our study adds to current knowledge on the causal effect of known and suspected influencing factors on OC and six histotypes. Further investigation is needed to better understand potential pathways or mechanisms of these factors.

**Key words** Association; Histotypes; Mendelian randomization; Ovarian cancer; Risk factor.

# 有营养风险和高 NRS 2002 评分与 COVID-19 患者的疾病进展和不良预后密切相关

## Nutritional risk and a high NRS2002 score are closely related to disease progression and poor prognosis in patients with COVID-19

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**Objectives:** To investigate the impact of nutritional risk and the NRS2002 score on disease progression and prognosis in patients with COVID-19.

**Methods:** This was a retrospective cohort study including 1228 COVID-19 patients, who were divided into a with-nutritional risk group (patients with NRS2002 score  $\geq 3$ ) and a without-nutritional risk group (patients with NRS2002 score  $< 3$ ) according to the NRS2002 score at admission. The differences in clinical and outcome data between the two groups were compared, and the relationship between the NRS2002 score and the disease progression and prognosis of COVID-19 patients was assessed.

**Results:** Of 1228 COVID-19 patients, including 44 critical illness patients and 1184 non-critical illness patients, the rate of harboring nutritional risk was 7.90%. Compared with those in the without-nutritional risk group, patients in the with-nutritional risk group had a significantly longer coronavirus negative conversion time, significantly lower serum albumin (ALB), total serum protein (TP) and hemoglobin (HGB), a significantly greater proportion with 3 or more comorbidities, and a significantly higher rate of critical illness and mortality (all  $P < 0.001$ ). Multiple regression analysis showed that nutritional risk, NRS2002 score and ALB were risk factors for disease severity. In addition, nutritional risk, NRS2002 score and TP were risk factors for prognosis. The NRS2002 score showed the best utility for predicting critical illness and death in COVID-19 patients.

**Conclusions:** Nutritional risk and a high NRS2002 score are closely related to disease progression and poor prognosis in COVID-19 patients. For patients with NRS2002 score  $> 0.5$ , early intervention of malnutrition is needed to reduce the occurrence of critical disease. Additionally, for patients with NRS2002 score  $> 5.5$ , continuous nutritional support therapy is needed to reduce mortality and improve prognosis.

**Key words** coronavirus disease 2019 (COVID-19), nutritional risk, NRS2002 score, disease progression, prognosis

## 住院患者炎症水平与水溶性维生素之间的关系:一项基于真实数据的横断面研究

### The association between inflammation and water-soluble vitamins in hospitalized patients: a cross-sectional study based on real-world data

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**Background and Aims** The association between inflammation and serum level of water-soluble vitamin remained unclear. We thus performed the current cross-sectional study based on real-world data to evaluate the association between serum level of C-reactive protein (CRP), a biomarker for inflammation, and water-soluble vitamin.

**Methods** Participants were recruited from our hospital from Oct 1, 2018 to Oct 31, 2022. Serum concentration of CRP and water-soluble vitamins measurements, fasting blood glucose, total bilirubin, direct bilirubin, alanine transferase, albumin, prealbumin, total cholesterol, triglycerides and the estimating glomerular filtration were abstracted from medical records. Information on age, sex, body weight, height, primary diagnosis, the history of chronic disease, diet intake, and surgery were collected as well. The association between CRP and water-soluble vitamins was analyzed by logistics regression analysis.

**Results** Of 9,818 patients, the median serum of CRP concentration was 0.66 (interquartile range: 0.5~3.02) mg/L. The prevalence of low level of vitamin B<sub>6</sub> was 21.6%, and it was 13.6% for vitamin B<sub>12</sub>, 5.0% for vitamin C, 2.7% for vitamin B<sub>1</sub>, 1.6% for vitamin B<sub>2</sub>, and 1.0% for vitamin B<sub>9</sub> in the current study. The risk of the low level of vitamin C (OR=1.06, 95%CI:1.02, 1.11) increased and vitamin B<sub>6</sub> (OR=0.94, 95%CI:0.90, 0.98) decreased with the increase of CRP level after further adjustment of potential confounders. Age and serum level of PreAlb interacted with the association between CRP and vitamin C. The association between CRP and vitamin C was similar between young adults (<65 y) and elderly adults (≥65 y). The association between CRP and vitamin C only remained in those whose serum level of pre-albumin was 160 mg/L or more.

**Conclusion** Inflammation was associated with high risk of low level of vitamin C and low risk of vitamin B<sub>6</sub>, while it was not associated with vitamin B<sub>1</sub>, B<sub>2</sub>, B<sub>9</sub>, and B<sub>12</sub>.

**Key words** water-soluble vitamins; C-reactive protein (CRP); vitamin C; vitamin B family; hospitalized patients



# 青少年短道速滑运动员的维生素 D 和血清炎症标志物之间的关系 -试点研究

## Relationships between Vitamin D and Hemogram-derived inflammatory markers in Adolescent Short Track Speed Skaters-Pilot Study

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**Objectives:** It was our purposes to test the relationship between 25-hydroxyvitamin D status and hemogram parameters - WBC, NEUTH(%), LYMPH(%), EOS(%), Mono(%), NEUYH, LYMPH, EOS, Mono, PLT, MPV, RDW, NLR and PLR, which are blood-borne inflammatory makers for adolescent short track speed skaters.

**Methods:** We enrolled 20 adolescent short track speed skaters (12 male, 8 female ). The age, height and weight were respectively:  $13.0 \pm 1.7$  years,  $161.5 \pm 8.6$  cm,  $52.1 \pm 8.7$  kg. This work used commercially available ELISA kits to test serum 25-hydroxyvitamin D concentration. Blood counts were measured by Beckman Coulter LH750 blood cell analyzer. Furthermore, inflammatory makers derived from hemogram parameters i.e. PLR and NLR were counted.

**Results:** Vitamin D deficiency and insufficiency were observed in 20% and 80% of the short track speed skaters in our study, respectively. A notably negative relationship between 25(OH)D level and mean platelet volume in male participants and a notably positive association between 25(OH)D and eosinophils (%) and eosinophils in female participants were found, but not in all athletes. For all participants, a notably positive correlation was observed only between vitamin D and monocytes.

**Conclusions:** According to the findings of our work, we noted that the low serum 25-hydroxyvitamin D in adolescent short track speed skaters is prevalent. Moreover, vitamin D deficiency may play a role in augmenting the risk of inflammation in adolescent athletes.

**Key words** 25(OH)D; inflammation; athletes

## 动物双歧杆菌乳亚种 XLTG11 辅助治疗儿童功能性便秘：一项随机、双盲、安慰剂对照研究

### Adjunctive Efficacy of *Bifidobacterium animalis* subsp. *Lactis* XLTG11 for Functional Constipation in Children: a Randomized, Double-blinded, Placebo-Controlled Study

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2. 迪辅乐微生物免疫代谢实验室

#### Background

Functional constipation (FC) can seriously affect the physical and mental health of children.

#### Objective

The goal of this study is to assess the efficacy and safety of *Bifidobacterium animalis* subsp. *Lactis* XLTG11, as an adjunct to the treatment of FC in children with a randomized, double-blinded, placebo-controlled study design.

#### Method

Eligible diarrheal children were randomized into intervention group (IG, n=65, conventional treatment with probiotic) and control group (CG, n=66, conventional treatment without probiotic). The primary outcome measure was the fecal frequency. Fecal gut microbiota (GM) analysis, the parents' subjective feelings score (PSFS) and the quality of family life scores (QFLS) were performed. PICRUSt was used to predict gene family abundances based on 16S information.

#### Result

The frequency of feces (times/week, t/w) in IG was significantly higher than that of children in the CG ( $3.69 \pm 2.62$  t/w vs.  $3.18 \pm 1.43$  t/w,  $4.03 \pm 2.54$  t/w vs.  $2.89 \pm 1.39$  t/w and  $3.74 \pm 2.36$  t/w vs.  $2.94 \pm 1.18$  t/w and  $3.45 \pm 1.98$  vs.  $3.17 \pm 1.41$  t/w for the 1st, 2nd, 3rd and 4th week after intervention, respectively) ( $F=7.60$ ,  $p=0.0067$ ). After intervention, both of the PSFS ( $7.05 \pm 2.04$  vs.  $6.04 \pm 1.71$  for IG and CG,  $p<0.05$ ) and QFLS ( $7.31 \pm 1.82$  vs.  $6.36 \pm 1.76$  for IG and CG,  $p<0.05$ ) in IG were significantly higher than those of children in CG ( $p<0.01$ ). After intervention, the dominate species changed to *Bifidobacterium longum*, *Bifidobacterium breve* and *Escherichia coli* in IG. After XLTG11 treatment, the short chain fatty acids metabolism related genes were up-regulated while the methane metabolism related gene was down-regulated.

#### Conclusion

Administration of XLTG11 at a dose of  $1 \times 10^{10}$  CFU/day to children can increase the fecal frequency, improve the fecal consistency and bring beneficial changes of intestinal microbiota composition and regulate SCFs and methane metabolism related genes in GM of children with FC with safety and reliability.

**Key words** probiotic, constipation, children, gut microbiota, RCT

# 动物双歧杆菌乳亚种 XLTG11 辅助治疗儿童急性腹泻：一项随机、双盲、安慰剂对照研究

## Adjunctive Efficacy of *Bifidobacterium animalis* subsp. *Lactis* XLTG11 for Acute Diarrhea in Children: a Randomized, Double-blinded, Placebo-controlled Study

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### Background

Acute diarrhea continues to be a leading cause of morbidity, hospitalization, and mortality worldwide. Probiotics have been proposed as a complementary therapy in the treatment of acute diarrhea.

### Objective

The goal of this study is to assess the efficacy and safety of *Bifidobacterium animalis* subsp. *Lactis* XLTG11, as an adjunct to the treatment of acute watery diarrhea in children with a randomized, double-blinded, placebo-controlled study design.

### Method

Eligible diarrheal children were randomized into intervention group (IG, n=35, conventional treatment with probiotic) and control group (CG, n=35, conventional treatment without probiotic). The primary assessments of this study were total duration of diarrhea. Fecal samples were collected from all children before and after intervention to measure levels of sIgA, calprotectin, human beta-defensin 2 (HBD-2), and cathelicidin (LL-37), and to analyze the gut microbiome (GM) composition. PICRUST was used to predict gene family abundances based on 16S information.

### Result

The total duration and the duration of hospital stay of diarrhea in the IG [(121.3±11.5 h) and (3.4±1.1d)] were significantly shorter than those of children in the CG [(133.4±14.1h) and (4.0±1.3 d),  $p < 0.001$  and  $p = 0.041$ , respectively). More children in the IG showed improvements in diarrhea for both per protocol analysis (57.1% vs 25.7%,  $p < 0.001$ ) and intention-to-treat analysis. The calprotectin levels in IG was markedly lower than that in CG after the intervention (928.91±158.90 ng/g vs. 1029.86±133.25 ng/g,  $p = 0.028$ ). The intervention led to higher abundance of species *Bifidobacterium longum* and *Bifidobacterium breve* and higher alpha-diversity of GM ( $p < 0.05$ ). XLTG11 treatment upregulated the functional genes of gut microbiota involving immunity and nutrient absorption.

### Conclusion

Administration of XLTG11 at a dose of  $1 \times 10^{10}$  CFU/day to children resulted in shorter duration of diarrhea, faster improvement in fecal consistency, and beneficial changes in GM composition and related gene functions.

**Key words** probiotic, diarrhea, children, gut microbiota, RCT

## 动物双歧杆菌亚种 *Lactis* BLa80 辅助治疗儿童急性腹泻：一项随机、双盲、安慰剂对照研究

### Adjunctive Efficacy of *Bifidobacterium animalis* subsp. *Lactis* BLa80 for Acute Diarrhea in Children: a Randomized, Double-blinded, Placebo-controlled Study

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#### Background

Acute diarrhea continues to be a leading cause of morbidity, hospitalization, and mortality worldwide. Probiotics have been proposed as a complementary therapy in the treatment of acute diarrhea.

#### Objective

The goal of this study is to assess the efficacy and safety of *Bifidobacterium animalis* subsp. *Lactis* BLa80, as an adjunct to the treatment of acute watery diarrhea in children with a randomized, double-blinded, placebo-controlled study design.

#### Method

Eligible diarrheal children were randomized into intervention group (IG, n=58, conventional treatment with probiotic) and control group (CG, n=53, conventional treatment without probiotic). The primary assessments of this study were duration of diarrhea. Fecal samples were collected from all children before and after intervention to measure levels of sIgA, calprotectin, human beta-defensin 2 (HBD-2), and cathelicidin (LL-37), and to analyze the gut microbiome (GM) composition. PICRUST was used to predict gene family abundances based on 16S information.

#### Result

After the intervention, the total duration of diarrhea in the IG ( $125.2 \pm 14.1$  h) was significantly shorter than that in the CG ( $138.7 \pm 16.4$  h,  $p < 0.001$ ). More children in the IG showed improvements in diarrhea than those in the CG for both per protocol analysis (84.4% vs 45.3%,  $p < 0.001$ ) and intention-to-treat analysis (81.7% vs. 40.0%,  $p < 0.001$ ). The LL-37 levels in the IG was markedly higher than that in the CG after the intervention ( $4415.00 \pm 1036.93$  pg/g vs.  $3679.49 \pm 871.18$  pg/g,  $p = 0.0175$ ). The intervention led to higher abundance of species *Bifidobacterium breve* and *Collinsella aerofaciens* and higher alpha-diversity ( $p < 0.05$ ). BLa80 treatment upregulated the functional genes of gut microbiota involving immunity regulation.

#### Conclusion

Administration of the *Bifidobacterium animalis* subsp. *Lactis* BLa80 at a dose of  $5 \times 10^9$  CFU/day to children aged 0-3 years resulted in shorter duration of diarrhea, faster improvement in fecal consistency, and beneficial changes in GM composition and gene functions.

**Key words** probiotic, diarrhea, children, gut microbiota, RCT

## 鼠李乳杆菌 LRa05 对儿童急性腹泻的辅助治疗作用：一项随机、双盲、安慰剂对照研究

### Adjunctive Efficacy of *Lactobacillus Rhamnosus* LRa05 for Acute Diarrhea in Children: a Randomized, Double-blinded, Placebo-controlled Study

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#### Background

Acute diarrhea continues to be a leading cause of morbidity, hospitalization, and mortality worldwide. Probiotics have been proposed as a complementary therapy in the treatment of acute diarrhea.

#### Objective

The goal of this study is to assess the efficacy and safety of *Lactobacillus rhamnosus* LRa05, as an adjunct to the treatment of acute watery diarrhea in children with a randomized, double-blinded, placebo-controlled study design.

#### Method

Eligible diarrheal children were randomized into intervention group (IG, n=57, conventional treatment with probiotic) and control group (CG, n=53, conventional treatment without probiotic). The primary assessments of this study were duration of diarrhea. Fecal samples were collected from all children before and after intervention to measure levels of sIgA, calprotectin, human beta-defensin 2 (HBD-2), and cathelicidin (LL-37), and to analyze the gut microbiome (GM) composition. PICRUSt was used to predict gene family abundances based on 16S information.

#### Result

After the intervention, the total duration of diarrhea in the IG ( $122.4 \pm 13.5$  h) was significantly shorter than that in the CG ( $138.7 \pm 16.4$  h,  $p < 0.001$ ). More children in the IG showed improvements in diarrhea than those in the CG for both per protocol analysis (70.2% vs 45.3%,  $p=0.008$ ) and intention-to-treat analysis (66.7% vs. 40.0%,  $p=0.003$ ). The LL-37 levels in the IG was markedly higher than that in the CG after the intervention ( $4349.35 \pm 1143.86$  pg/g vs.  $3679.49 \pm 871.18$  pg/g,  $p=0.042$ ). The intervention led to higher abundance of *Bifidobacterium longum* and lower abundance of *Enterococcus faecium*, *Lactobacillus rhamnosus*, and *Bacteroides fragilis* ( $p < 0.05$ ). LRa05 treatment up-regulated the functional genes of gut microbiota involving immunity regulation.

#### Conclusion

Administration of the *Lactobacillus rhamnosus* LRa05 at a dose of  $5 \times 10^9$  CFU/day to children aged 0–3 years resulted in shorter duration of diarrhea, faster improvement in fecal consistency, and beneficial changes in GM composition and gene functions.

**Key words** probiotic, diarrhea, children, gut microbiota, RCT

## 同型半胱氨酸-蛋氨酸循环代谢产物、细胞因子与急性缺血性脑卒中关系的研究

### Study on the relationship between homocysteine-methionine cycle metabolites, cytokines and acute ischemic stroke

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#### Abstract:

**Objectives:** This paper discusses the relationship between homocysteine (Hcy), S-adenosylmethionine (SAM), S-adenosylhomocysteine (SAH) and cytokines and acute ischemic stroke (AIS).

**Materials and Methods:** 123 AIS patients hospitalized in the Department of Neurology of the first hospital of Hebei Medical University were included as the case group, and 125 non stroke patients who underwent physical examination in our hospital were selected as the control group. Collect general information of subjects and the results of blood biochemistry and blood routine examination at admission or physical examination. The serum levels of oxidized low density lipoprotein cholesterol (ox-LDL), interleukin 6 (IL-6) and tumor necrosis factor  $\alpha$  (TNF- $\alpha$ ), Intercellular adhesion molecule 1 (ICAM-1), high-sensitivity C reactive protein (hs-CRP), homocysteine (Hcy), SAM and SAH were detected and analyzed.

**Results:** The serum levels of Hcy, SAM and SAM / SAH in the case group were significantly higher than those in the control group ( $P \leq 0.05$ ). The serum SAH level in the case group was significantly lower than that in the control group ( $P < 0.05$ ). Serum hs-CRP, ICAM-1, IL-6, TNF- $\alpha$ , the blood neutrophil lymphocyte ratio (NLR) and platelet lymphocyte ratio (PLR) in the case group were significantly higher than those in the control group ( $P < 0.05$ ). Logistic regression analysis showed that Hcy and SAM were the risk factors of AIS ( $P < 0.05$ ).

**Conclusions:** The increase of serum Hcy and SAM concentration is the risk factor of AIS; the change of the cytokine level is related to the pathogenesis of AIS. The more serious the patient's condition is, the lower TNF- $\alpha$ , the higher the levels of blood neutrophil lymphocyte ratio (NLR) and platelet lymphocyte ratio (PLR). These three indexes can be utilized to judge the severity of patients' early disease.

**Key words** ischemic stroke, S-Adenosylmethionine, S-Adenosylhomocysteine, homocysteine, cytokines

# 肌少症对维持性血液透析患者生存预后的影响分析

## Impact of sarcopenia on mortality in patients undergoing hemodialysis

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**Background:** Sarcopenia, characterized by impaired muscle mass and function, is a common complication in maintenance hemodialysis (MHD). However, research on the mortality of sarcopenia in MHD patients is limited. **Objective:** To investigate the impacts of sarcopenia on mortality in MHD patients. **Methods:** All 143 MHD patients recruited in this cohort study in March 2021 were tested with bioelectrical impedance analysis and grip strength. Demographic data and laboratory indicators were collected. The patients were divided into sarcopenia and non-sarcopenia groups according to the criteria established by the Asian Working Group on Sarcopenia. By following up for 18 months, the survival status was documented. Kaplan-Meier survival curve, multivariate Cox proportional hazard model, and Fine-Gray competing risk model were used to assess the relationship between sarcopenia and all-cause mortality, cardio-cerebrovascular mortality, and infectious disease mortality. **Results:** The sarcopenia group had older age, higher spKt/V, the ratio of extracellular to intracellular water and IL-6, and lower BMI, serum phosphorus, serum creatinine, serum albumin, serum prealbumin, extracellular water, intracellular water, grip strength, appendicular skeletal muscle index levels and physical activity compared to the non-sarcopenia group, all with statistically significant differences (all  $P < 0.05$ ). Kaplan Meier curves showed that the overall survival rate of the sarcopenia group was lower than those of the non-sarcopenia group (Log-rank test  $\chi^2=15.99$ ,  $P < 0.001$ ). Multivariable Cox regression analysis and Fine-Gray competing risk model demonstrated that sarcopenia was independently correlated with all-cause mortality and infectious diseases mortality after adjusting for confounding factors ( $HR=2.75$ , 95%CI 1.07–7.10,  $P=0.036$ ;  $SHR=5.76$ , 95%CI 1.15–28.96,  $P=0.034$ ). **Conclusion:** There was highly prevalent sarcopenia among this cohort of patients with MHD. Moreover, sarcopenia was an independent predictor of all-cause mortality and infectious disease mortality in MHD patients.

**Key words** sarcopenia; maintenance hemodialysis; all-cause mortality; infectious disease mortality

# 一项 meta 分析：口腔微生物对恶性肿瘤生存期的影响

## Prognostic Impact of Oral Microbiome on Survival of Malignancies: A Systematic Review and Meta-Analysis

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**Background** Emerging studies have shown that there is a close link between oral microbiome and the occurrence of malignancies. However, the prognostic significance of oral microbiome for patients is poorly investigated. This meta-analysis aimed to evaluate the effect of oral microbiome on survival of malignant neoplasms.

**Methods** PubMed, Embase, and Cochrane Library databases until September 2022 were searched. The hazard ratio (HR) corresponding to 95% confidence interval (CI) of survival including overall survival (OS), disease-specific Survival (DSS), progression-free survival (PFS), and disease-free survival (DFS) were analyzed using Review Manager 5.4 software.

**Results** A total of 15 studies, covering 5191 samples with different types of cancers, were selected based on specified inclusion and exclusion criteria. In univariate and multivariate analysis, patients with low diversity of oral microbiome, or Fusobacterium-high/positive, or *P. gingivalis* positive in cancer tissue had poorer OS (univariate HR = 1.74; 95% CI: 1.15 - 2.62; P = 0.009; multivariate HR = 1.56; 95% CI: 1.07 - 2.27; P = 0.02), DSS (univariate HR = 2.06; 95% CI: 1.50 - 2.84; P < 0.00001; multivariate HR = 1.80; 95% CI: 1.48 - 2.20; P < 0.00001), and PFS/DFS (univariate HR = 2.00; 95% CI: 1.12 - 3.58; P = 0.002; multivariate HR = 1.78; 95% CI: 1.05 - 3.02; P = 0.003). We also did a further subgroup analysis, Fusobacterium positive or high abundance in cancer tissues had poor OS than those without by multivariate analysis. But had no effect on PFS or DFS by univariate and multivariate analysis. *P. gingivalis* positive in cancer tissue also had worse OS.

**Conclusions** Oral microbiome may be the prognostic factors on survivals of patients with malignancies.

**Key words** Oral Microbiome, Malignancies, Survival, Meta-Analysis



# **运动员感染 COVID-19 后的营养状态评估和饮食应对策略**

## **Assessment of nutritional status and dietary coping strategies after COVID-19 infection in athletes**

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**Objective:** COVID-19 imposed restrictions are associated with many health consequences, particularly in athletes. Adverse changes in physical activity and nutrition may affect subsequent athletic and competition performance. Studies to date have shown that athletes who are typically young, healthy and free of comorbidities are at lower risk of serious symptoms and fatal outcomes from COVID-19 infection than the general population. However, the potential short- and long-term effects of COVID-19 infection remain largely unknown. This study was conducted to assess the impact of COVID-19 infection and pandemic restriction on the nutrition and physical activity of athletes; and to compare the blood index results of athletes before and after infection. **Methods:** Twenty-seven professionally trained male football players (mean age =  $16.03 \pm 1.14$  years, height =  $178.4 \pm 5.8$  cm, weight =  $72.3 \pm 5.4$  kg; BMI =  $24.0 \pm 2.6$  kg·m<sup>-2</sup>) underwent pre- and post-COVID-19 surveys and completed dietary and physical activity surveys. **Results:** 1. After COVID-19 infection, athletes' physical activity gradually resumed and dietary modification strategies using high quality vegetable protein instead of meat and enhanced intake of different substances such as essential fatty acids, linoleic acid, essential amino acids and the aforementioned vitamins and minerals improved the immune response, especially in the case of viral infections, and immunity improved and increased. 2. COVID-19 infection causes a marked deterioration in the performance of blood indicators. Following COVID-19 infection, testosterone and ferritin are reduced. Consumption of processed meat and replacement of meat with plant-based protein affected haemoglobin concentrations ( $p = 0.045$ ). Changes in fat content were associated with unsaturated fatty acids ( $p = 0.033$ ).

**Conclusion:** Nutritional status and blood markers in athletes following COVID-19 infection should be regularly followed up every three months to assess and adjust dietary strategies timely.

**Key words** COVID-19; diet; football athletes; nutrition; sport performance

# 康复营养干预在肌少症性吞咽困难的应用效果

## Effectiveness of rehabilitative nutritional intervention in sarcopenic dysphagia

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**OBJECTIVE:** Sarcopenic dysphagia is characterized by dysphagia caused by sarcopenia and loss of swallowing muscle mass and function. The purpose of this article is to explore and review the effectiveness of rehabilitative nutritional management in the application of myasthenia gravis dysphagia.

**METHODS:** The keywords "rehabilitation nutrition, myasthenia gravis, sarcopenia, swallowing dysfunction" were searched in "CNKI, Wan fang , PubMed" databases and summarized.

**RESULTS:** The essence of rehabilitation nutrition is the combination of nutritional support and rehabilitation therapy, and the rehabilitation nutritional interventions for myasthenia gravis have been attracting attention in recent years. The current nutritional interventions are mostly based on dietary intake and enteral nutrition calculated and guided by professionals, and the starting amount of nutritional intake varies from person to person, ranging from 1200 kcal/d to 1900 kcal/d. Rehabilitation interventions include resistance exercises, respiratory training, walking, oral exercises, and tongue exercises. According to the results of the current study, "active rehabilitative nutritional interventions in patients with myasthenia gravis can improve the Mini-Nutritional Assessment Profile, biochemical nutritional indicators, anthropometric data, bioimpedance body composition, modified Barthel Index, tongue pressure measurements, separate use of Functional Independence Measure and Mann Assessment of Swallowing Ability, grip strength, and skeletal muscle mass index, and providing high energy intake of  $\geq 30$  kcal/IBW/day may be more effective in improving myasthenia gravis swallowing. Therefore, rehabilitative nutritional management may improve not only swallowing function and nutrition but also function, activity, participation, and quality of life in patients with myasthenia gravis swallowing disorder. **CONCLUSION:** According to the results of the current study, rehabilitation nutrition management is beneficial for patients with sarcopenic dysphagia; Moreover, the combination of rehabilitation nutrition intervention may be a major direction for future research.

**Key words** Rehabilitation nutrition; Myasthenia gravis; Sarcopenia; Swallowing dysfunction

# 维持性血液透析患者的高血清降钙素水平与其更好的营养状态相关

## Higher Serum Calcitonin Levels Are Associated With a Better Nutritional Status in Patients Undergoing Maintenance Hemodialysis

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**Objective:** This study aimed to investigate the relationship between serum calcitonin levels and the nutritional status in patients undergoing maintenance hemodialysis (MHD).

**Design and Methods:** Patients undergoing MHD at our center in March 2021 were enrolled in this cross-sectional study. Patients' demographic and clinical data and blood samples were collected before the hemodialysis sessions. Serum calcitonin levels and other biochemical parameters were measured using electrochemiluminescence. The nutritional status of these patients was comprehensively evaluated using grip strength (GS), pinch strength, mid-arm muscle circumference (MAMC), triceps skinfold thickness, 7-point subjective global assessment (SGA), and nutritional risk screening 2002 (NRS 2002). Multivariate binary logistic regression and multiple linear regression analyses were performed to investigate the relationship between serum calcitonin levels and the nutritional status.

**Results:** In total, 155 patients (90 men, 65 women) were included, with a median age of 66 (range, 58.0–75.0) years and a median dialysis vintage of 28 (range, 11.0–55.0) months. The median serum calcitonin level of all participants was 3.37 (range, 0.55–43.01) pg/mL. Forty-four patients (28.4%) and 33 patients (21.3%) were malnourished, as defined by the 7-point SGA, and with nutritional risk, as defined by the NRS 2002, respectively. After adjusting for confounding factors, the results of the multivariate binary logistic regression analyses showed that higher calcitonin levels or higher serum calcitonin tertiles were independently associated with better nutrition, and multiple linear regression analysis showed that higher serum calcitonin levels were independently associated with higher levels of GS and higher values of MAMC.

**Conclusion:** Higher serum calcitonin levels were independently associated with a better nutritional status in patients undergoing MHD; however, multicenter studies with larger sample sizes are still needed to determine its value as a novel nutritional biomarker in patients undergoing MHD.

**Key words** Serum calcitonin; Maintenance hemodialysis; Nutritional risk; NRS 2002; SGA

Category: Clinical Nutrition

## **MIND 饮食对卒中的影响研究进展**

### **Research progress on the effect of MIND diet on stroke**

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**Objective:** The incidence of stroke has increased significantly in recent years, which is inseparable from people's dietary habits. The purpose of this paper is to explore the effect of MIND diet on stroke and to provide ideas for stroke prevention and healthy dietary guidance. **Methods:** The keywords "MIND diet, Mediterranean diet, Anti-hypertensive diet, Stroke, Cerebrovascular disease" were searched in CNKI, Wan fang and PubMed databases and summarized. **Results:** The MIND diet consists of a Mediterranean diet and an Anti-hypertensive diet consisting of whole grains, green leafy or other vegetables, berries, legumes, nuts, lean meat, fish, poultry and olive oil, and a reduced intake of cheese, butter, fried foods and sweets. According to the present study, the final food frequency questionnaire score correlated negatively with the occurrence of stroke events, meaning that the higher the MIND diet dependence, the lower the incidence of stroke, while the MIND diet was found to be associated with a slower decline in cognitive function after stroke after adjusting for age, sex, physical activity, education, caloric intake and smoking. Therefore, the MIND diet is negatively associated with stroke and may have a preventive and mitigating effect on the onset of cognitive impairment after stroke. **Conclusion:** The MIND diet is negatively associated with the occurrence of stroke and may have a preventive and mitigating effect on the development of cognitive impairment after stroke.

**Key words** MIND diet; Mediterranean diet; Anti-hypertensive diet; Stroke; Cerebrovascular disease