

## **The integration of traditional herbal medicines with modern scientific pharmaceutical and medical systems in Japan: Quality control, clinical application, and regulation**

**Ichiro Arai**

Graduate School of Pharmaceutical Sciences, Nihon Pharmaceutical University, Japan

**Background:** Japanese Kampo medicine is a traditional medicine with roots in ancient Chinese medicine. Because traditional physicians had been abolished in Japan, the present mainstream of Kampo treatment is that physicians who learned modern Western medicine prescribe Kampo extract products based on Western medical diagnosis. In the national exam for pharmacists, questions about Kampo medicines are asked every year. This situation is different from that in other East Asian countries.

**Regulations:** Kampo medicines have been approved as official medicines by the Japanese government; they are covered by national health insurance and are used regularly in the standard healthcare system in Japan. Kampo medicines accounted for approximately 2.1% of Japan's total pharmaceutical sales in 2021, and the majority were dry extract products for prescription. Currently, 148 prescription Kampo formulations are covered by the national insurance system, and the official approval standards for over-the-counter Kampo products have been established for 294 formulations. All adverse drug events of Kampo medicines are collected by the government as well as modern medicines.

**Quality control:** The Japanese Pharmacopoeia (JP) contains monographs on almost all the crude drugs that are the raw materials for Kampo medicines. The quality of Kampo extract products is ensured through the equivalence of dry extract and two or more marker components with decoction (standard decoction). The JP also contains monographs on formulation extracts that have high sales volumes. For manufacturing, Kampo good manufacturing practice (Kampo GMP), the self-imposed standard of the Federation of Pharmaceutical Manufacturers' Associations of Japan, has been instituted in addition to the standard GMP for conventional medicines. The quantity of pesticide residues, heavy metals and arsenic, and microorganisms in Kampo products and crude drugs is controlled by the JP and manufacturers' voluntary standards.

**Clinical application:** According to a 2011 Web-based survey, 89% of 627 randomly selected physicians reported active use of Kampo products. Diseases for which Kampo medicines were frequently prescribed included muscle cramps (44.1%), acute upper respiratory tract inflammation (40.1%), constipation (38.5%), indefinite complaints/menopausal symptoms (35.5%), and ileus (19.4%). The doctors prescribed Kampo medicines in combination with modern medicines for 82.9% of their patients. And although 52% of the doctors based their prescriptions on a modern medical diagnosis alone and 32% on both modern and traditional diagnostic methods, they

mainly depend on modern medical diagnoses in their decision-making. By 2021, 529 RCTs (randomized controlled trials) and 15 meta-analyses have been conducted on Kampo extract preparations.

**Conclusion:** Kampo medicines are approved as a legal pharmaceutical product of Japan and their quality is highly assured by Japanese authorities and each manufacturer. Clinical evidence has been accumulated from many randomized clinical trials and meta-analyses.

**Key words:**

Kampo medicines, traditional herbal medicines, regulation, quality control, clinical application