



Kampo medicine for Frailty as Kidney deficiency

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Abstract

This review aims to understand the clinical efficacy of Japanese Traditional (Kampo) medicine for managing frailty-related disorders mainly based on Kidney deficiency.

Kampo is Japanese traditional herbal medicine, and is the most frequently used alternative and complementary medicine in Japan. The aim of Kampo therapy is to improve patients' condition whatever their diseases are. Kampo therapy is unique because its focus is patient's condition not their disease. Moreover, it is widely used as Kampo formulas are covered by National Insurance System in Japan. Therefore, Kampo Medicine plays more and more important roles in closing the gap between modern Western Medicine and demand of patients. With the advent of an aging society, the concept of a fragile state of mind and body that leads to many health problems, "Frailty", was proposed. It is not easy to prevent or cure frailty because it contains complexed factors. Here, Kampo medicine often obtains and analyzes a large amount of information through four examinations, and can grasp and deal with an aging state such as frailty. This article outlines the effects of representative formulas on frailty related to Kidney deficiency, like lumbago and arthralgia which often cause deterioration of ADL and QOL of patients. Our review showed some evidence for the usefulness of representative Kampo formulas for Kidney deficiency, hachimigan and goshajinkigan. Our review suggests that these formulas have the potential to be used for the management of aging-related and frailty symptoms, although further clinical studies in elderly patients should be conducted.

Key words: Kampo medicine, Frailty, Physical Performance, Kidney Deficiency, Gosyajinkigan, Hachimigan

Introduction

Traditional Japanese medicine, or Kampo medicine, has been used for various symptoms that appear due to aging. Japan is expected to play an important role in today's aging advanced country. Among elderly people in Japan, the population of late elderly people who are said to be in need of long-term care is expected to increase rapidly to 11.1% in 2010, 18.1% in 2025, and 26.9% in 2060 [1]. Preventing long-term care is an important issue not only for the better life of the elderly, but also for reducing medical expenses that squeeze Japan's

national finance and for avoiding a decrease in the workforce due to work separation due to the burden of long-term care. On the other hand, chronic pain of the musculoskeletal, such as lumbago, stiff shoulders, and arthralgia in the extremities, which cause needing care, is rising in 65 years of age and above. Thus, pain management is very important in preventing frailty. In this review, how Kampo treatment for Kidney deficiency works for frailty prevention will be explained.

Frailty

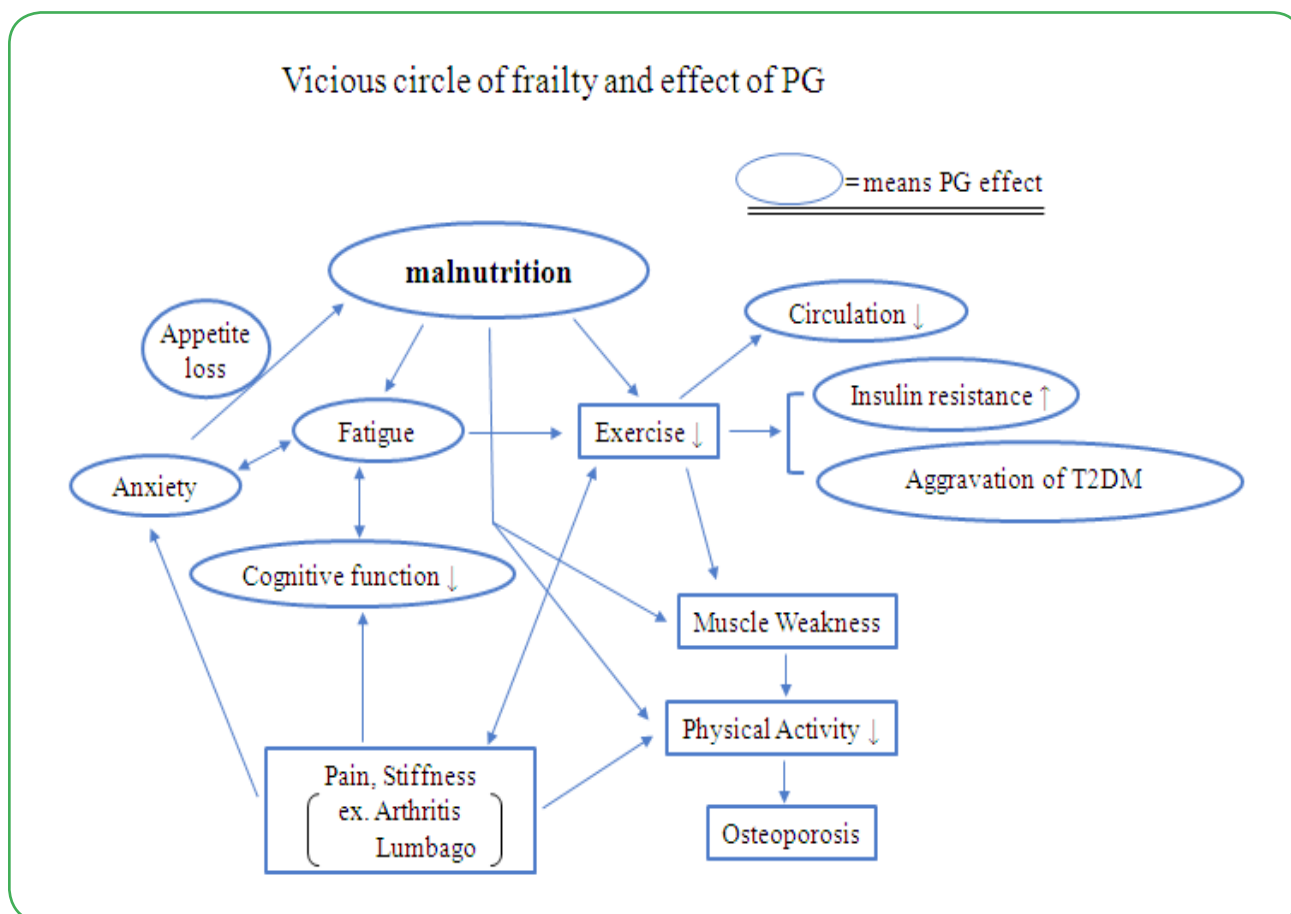
The concept of "frailty", which has been proposed in accordance with the arrival of an aging society, is a fragile state of mind and body that leads to health problems, and is a state resulting from a decrease in reserve for stress. The constituents of frailty include body composition, physical function, physical activity, fatigue, mental and psychological state, social problems, etc [2]. Decrease in physical activity reduces total energy metabolism, decreases appetite, and leads to malnutrition. As a result, the ability to walk decreases due to decrease in muscle strength and muscle mass, which would limit the activity. A vicious circle is formed in which the frailty accelerates the various factors involved (Fig. 1).

In this way, frailty tends to cause independence and a need for nursing care, and early detection and early intervention are necessary. However, it is extremely difficult to set a boundary with "healthy status" because frailty is so-called preclinical status. It is important to understand the concept of frailty and evaluate the physical and mental function of patients to determine frailty. The diagnostic criteria are following; unintentional weight loss (10 lbs. in the previous year), self-reported exhaustion, weakness 2).

Also, as mentioned above, improving physical activity is essential to break the vicious circle of frailty, but fatigue, loss of appetite, and chronic pain such as lumbago and arthritis might be obstruction. Also, pain of elderly patients often occur not only in a single site, but often overlaps. Pain affects the elderly's motor function, ADL, psychology, and physical activity, and pain control is also important for frailty prevention.

Frailty and Kampo medicine

In Kampo medicine, there is a concept of "mibyuu" or not-yet-ill,



and through four examinations, the aging state like frailty has been recognized. From this background, it can be said that there is an affinity between the concept of frailty and the concept of Kampo medicine. For example, “formulas for supplementation” are effective in treatment methods that improve fatigue, which are limited in modern medical treatment. By taking supplements, the amount of activity increases, and it becomes possible to prevent decrease in muscle mass and physical function. If rehabilitation is needed after any disease, patients can complete the task with enough motivation. In frailty, mental and physical fragile conditions, the Kampo supplementation formulas are basically considered to be effective.

Kampo formulas

In Kampo medicine, back pain is considered a symptom of Kidney. Kidney stones the innate qi from the view of five organs concept. A decline in function centering on the adrenal gland, urinary system, and reproductive system that occurs with aging is called Kidney deficiency. Major symptoms include weakness, pain, numbness in the lower body, general malaise, abnormal urination, low back pain, coldness and hot flashes in the limbs, and decreased sexual function.

Hachimigan (HMG, or Ba-Wei-Di-Huang-Wan) and gosyajinnkigan (GJG; Niu Che Shen Qi Wan) are typical Kampo formulas for improving Kidney deficiency. Since these formulas don't contain licorice, there is no risk of pseudoaldosteronism, but there is a possibility of gastrointestinal discomfort due to jiu, so it needs to be administered with caution.

HMG consists of 8 crude drugs; Rehmannia Root, Cornus Fruit, Dioscorea Rhizome, Alisma Rhizome, Hoelen, Moutan Bark, Cinnamon Bark, and Aconite Tuber. It is applied in cases of nephritis, diabetes, impotence, sciatica, lumbago, bladder catarrh, prostatic hypertrophy, and hypertension, among others. It has been reported that HMG can improve quality of life in patients with the intermittent claudication with peripheral arterial disease (PAD) [3]. A pilot study

suggests that HMG therapy was a well-tolerated and effective treatment for dementia patients. HMG can be a new beneficial candidate to widen therapeutic options for treating dementia [4].

GJG is a formula that adds Achyranthes Root and Plantago Seed to HMG. Central analgesia has been observed through the stimulation of the κ opioid receptor, whereas peripheral analgesia has been observed through increased nitric oxide production [5]. In a mouse model of neuropathic pain, analgesia has been reported through suppression of TNF- α expression from activated microglia [6]. The preventive effect of diabetes complications in 116 patients was investigated and deterioration of the ankle reflex after 5 years of observation was decreased in GJG group. In addition, glycated hemoglobin and fasting plasma glucose were reduced in the GJG group [7]. In senescence-accelerated mice, it was shown that GJG suppressed sarcopenia via the IGF-1/insulin pathway, maintained the expression of mitochondrial-related transcription factors, and suppressed TNF- α [8]. These results indicate that GJG is a promising candidate for relief from sarcopenia. It has been reported that Kidney “supplements” are effective against osteoporosis, which is one of important factor in physical frailty. Otake et al. [9] reported bone mass maintenance effect. As osteoporosis progresses with age, vertebral spinal stenosis due to compression fractures of the spine and degenerative changes of the spine are also frequent. When an anti-inflammatory analgesic is ineffective or its effect is insufficient, daily life is hindered, and physical activity is reduced, resulting in a vicious circle of frailty progress. In addition, even if anti-inflammatory analgesics are effective, side effects of long-time use such as gastrointestinal symptoms or liver damage due to regular administration would be problematic.

HMG and GJG contain Aconite Tuber which is empirically known to be effective on chronic pain. In the Seltzer model mice, it is indicated that the activation of spinal astrocytes was responsible for the late

maintenance phase of neuropathic pain and that the inhibition of astrocytic activation by Bushi, or Aconite Tuber, could be a useful therapeutic strategy for treating neuropathic pain [10].

If the above-mentioned formulas are not sufficient for pain or for yan qi deficiency due to aging, we recommend to start Aconitine Tubar powder from 1 g / day. Its side effects are mainly the action of aconitine. Initially, there might be numbness of tongue, and a feeling of jealousy such as flushing of the face. Gastrointestinal symptoms such as nausea and vomiting, leading to arrhythmia, muscle spasm, or respiratory paralysis. It is important not to miss the initial symptoms.

Future directions

With the aging society, the role of Kampo medicine to prevent frailty is expected to expand more and more. Since frailty in the elderly often generates a vicious circle, Kampo medicine that can grasp the symptoms as a whole would be more important. Prescriptions based on Kampo medicine theory are more effective for individual pathologies. In addition, since a long-term administration due to symptoms associated with aging is inevitable, safety considerations are even more important.

In conclusion, HMG and GJG are suitable formulas for frailty according to the concept of Kidney deficiency.

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