



Observational Study of the Association Between Tongue Exam and the *Kampo* Diagnostic Procedure of *Fuku Shin* (Abdominal Exam) in Blood Stasis

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Abstract

Blood stasis is a very important pathophysiological concept not only in *Kampo* but also in traditional Chinese medicine. Blood stasis indicates severe disease. *Fuku shin* (the abdominal exam) and *Zetsu shin* (the tongue exam) are the most important approaches of the 4 diagnostic procedures in *Kampo*. Tenderness of the lower abdominal region (*Sho fuku koh man*) and distended sublingual veins have been mentioned as typical signs of blood stasis in *Kampo* or traditional Chinese medicine. The aim of the present study was to determine the association between *Sho fuku koh man* and distended sublingual veins. An appearance of sublingual veins and a level of *Sho fuku koh man* showed a significant and positive correlation ($r_s = .5248$; $n = 279$; $P < .0001$). In conclusion, the relationship between the appearance of sublingual veins and the level of *Sho fuku koh man* showed a significant and positive correlation.

Keywords

blood stasis, tongue exam, abdominal exam

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Kampo, or traditional Japanese herbal medicine based on traditional Chinese herbal medicine, has been used for the treatment of chronic pain in Japan.¹⁻⁵ Traditional Chinese medicine and *Kampo* developed a characteristic system.¹⁻⁴ There are essentially 3 dichotomies and 3 substance concepts in the system. The 3 dichotomies are *Yin-You* (ying-yang), *Kyo-Jitsu*, and *Netsu-Kan* (translated in English as positive-negative, hollow-full, and hot-cold, respectively). The 3 substance categories are *Ki* (Qi), *Ketsu*, and *Sui*. *Ki* (Qi) is energy fundamental to living things. In contrast to the *Ki* (Qi) concept, *Ketsu* and *Sui* are much closer to the common concepts of blood and body fluids, respectively. In *Kampo*, the healthy state of human beings means a well-balanced or nondeviated condition of the 3 dichotomies and the 3 substance concepts. When assessing disease due to deviation, 4 specific diagnostic procedures are used. According to *Kampo* theory, the most appropriate *Kampo* formula should be prescribed for each individual based on 4 diagnostic procedures.¹⁻⁴

Fuku shin (the abdominal exam) is unique to Japan and is one of the most important approaches of the 4 diagnostic procedures in *Kampo*.¹⁻⁴ There are several *Fukushos* (abdominal conformations) when administering *Fuku shin*. *Sho fuku koh man* (lower-

abdominal hardness and tenderness) is one of the major *Fukushos*. *Sho fuku koh man* has been mentioned as the typical sign of blood stasis syndrome.^{2,3} On the other hand, *Zetsu shin* (the tongue exam) is one of the most important approaches of the 4 diagnostic procedures not only in *Kampo* but also in traditional Chinese herbal medicine.^{2,3,6,7} *Zetsu shin* includes examination of the sublingual veins. A pattern of blood stasis is often reflected by pathological deviations in the sublingual veins.^{3,6} Especially, distended sublingual veins are known to precisely reflect blood stasis after evaluation of the significance in diagnosis. When a patient has a chronic disease, there might be some symptoms of blood stasis. Moreover, blood stasis indicates poor prognosis and severe disease.^{8,9} Therefore, it is very important to increase diagnosis accuracy of blood stasis and forge an objective standard for

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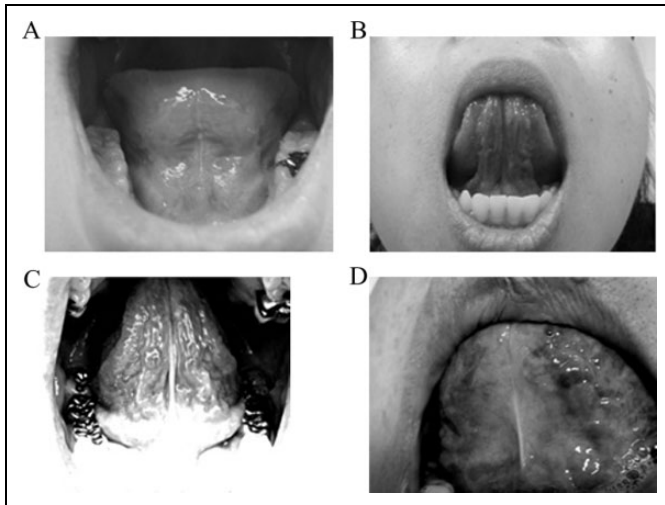


Figure 1. *Zetsu shin*, the tongue exam: (A) Not distended; (B) Slightly distended; (C) Moderately distended; (D) Markedly distended.

diagnosis of blood stasis. We hypothesized that a combination of *Fuku shin* and *Zetsu shin* increases diagnosis accuracy. However, few reports have studied the association between *Fukushos* and the appearance of sublingual veins. Thus, the aim of the present study was to determine the association between *Sho fuku koh man* and distended sublingual veins.

Methods

After obtaining approval from the Ethics Committee of Aichi Medical University for the review of *Kampo* medicine in the Pain Center (Reference Number: 13-097), analysis from May 2013 to February 2015 was performed on patients suffering from chronic pain who visited the Pain Center of Aichi Medical University Hospital. All patients were referred from other hospitals to the Pain Center. In the present study, 279 patients who were prescribed *Kampo* extract formulations were included.

After obtaining approval from the Ethics Committee of Aichi Medical University, we routinely explained to all patients that we record and store demographics, symptoms, course of pain, and medical records of all patients for possible future use in our research before obtaining written informed consent during their initial visit to the Pain Center.

In order to prescribe *Kampo* medicines for patients, we administered patient-centered *Kampo* diagnosis. First, we asked patients to expose the underside of the tongue when administering tongue diagnosis, as shown in Figure 1.^{2,3,6,7} One of the investigators (Aono) rated the appearance of the veins on a scale of 0 to 3 (0 = not distended; 1 = slightly distended; 2 = moderately distended; 3 = markedly distended; Figure 1). Then, we had the patient lie on his or her back with both legs extended. While applying pressure to the patient's lower abdomen by the pulps of the right middle 3 fingers of an examiner (Arai),^{2-4,7} tenderness was rated by the patient with a 4-point scale: 0 = no pain or uncomfortable feeling; 1 = slight pain or uncomfortable feeling; 2 = moderate pain; 3 = marked pain.

Three of the authors (Arai, Makino, Aono) scored a subset of 50 pictures of the sublingual veins recorded in order to assess interrater agreement. Since the 4-level classification of the scale showed high interrater agreement ($\kappa = 0.7-0.8$), we used the score rated by Aono as mentioned above.

Values are numbers or median (range). The association between the appearance of sublingual veins and the level of *Sho fuku koh man*,

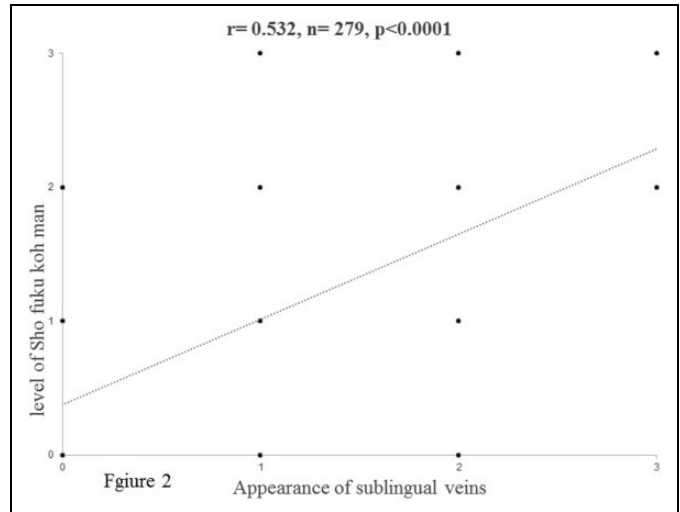


Figure 2. Scatterplot of the appearance of sublingual veins versus the level of *Sho fuku koh man* with regression line.

Table 1. Patients' Characteristics^a.

Age (years)	56 (13-89)
Sex (male/female)	95/184
Weight (kg)	52 (30-100)
Duration of pain (months)	24 (3-480)

^aValues are numbers or mean (range).

Table 2. Most Frequent Medical Complaints.

Medical Complaint	% (n)
Low-back/lower-limb pain	25.1 (70)
Various facial pains	19.7 (55)
Neck/upper-limb pain	15.8 (44)
Headache/migraine	12.5 (35)
Pain at multiple sites	7.9 (22)

lower-abdominal hardness and tenderness, was analyzed using correlation coefficient *r t* test. A *P* value of $<.05$ was considered significant.

Results

We administered treatment after a medical conference attended by different types of professionals (anesthesiologists, orthopedists, psychiatrists, internists, dentists, nurses, physical therapists, and clinical psychotherapists) in the Pain Center. As required at the medical conference, we administered pharmacological (including *Kampo* medicine), physical, acupuncture, cognitive-behavioral, psychoanalytic, and psychological treatment. *Kampo* medicines were prescribed for patients based on patient-centered *Kampo* diagnosis⁵ when treatment with Western medicine alone was insufficient. The demographic characteristics are presented in Table 1. Table 2 lists the most frequent medical complaints for which *Kampo* medicines were prescribed. *Kampo* medicines were prescribed to treat

low-back/lower-limb pain (25.1%, n = 70), various facial pains (19.7%, n = 55), neck/upper-limb pain (15.8%, n = 44), headache/migraine (12.5%, n = 35), and pain at multiple sites (7.9%, n = 22). The relationship between the appearance of sublingual veins and the level of *Sho fuku koh man* showed a significant and positive correlation ($r = .532$; $n = 279$; $P < .0001$; see Figure 2).

Discussion

The main finding of the present study is that the appearance of sublingual veins and the level of *Sho fuku koh man* showed a significant and positive correlation ($r = .532$; $n = 279$; $P < .0001$). *Kampo* medicines were prescribed to treat low-back/lower-limb pain (25.1%, n = 70), various facial pains (19.7%, n = 55), neck/upper-limb pain (15.8%, n = 44), headache/migraine (12.5%, n = 35), and pain at multiple sites (7.9%, n = 22). In fact, we had these cases in the almost - same order in our center as shown in a previous study.⁵

Blood stasis is a very important pathophysiological concept not only in *Kampo* but also in traditional Chinese medicine.^{2,3,6,7} When patients have a long-term, chronic disease, there would be some symptoms of blood stasis such as pain and stiffness.⁶ Blood stasis indicates severe disease.^{8,9} However, since a precise concept of blood stasis from the standpoint of Western medicine has yet to be established,¹⁰ an objective standard for diagnosis of blood stasis is useful and needed not only for Western medicine practitioners but also for oriental medicine practitioners.

There are the 4 diagnostic procedures that make up what is called in *Kampo* the 4 exams by which *Kampo formula* is prescribed for each individual.¹⁻⁵ *Fuku shin* (the abdominal exam) and *Zetsu shin* (the tongue exam) are the most important approaches of the 4 diagnostic procedures in *Kampo*. The signs of several diseases in the abdomen were originally established in Japan.⁷ Tenderness of the lower abdominal region (*Sho fuku koh man*) has been mentioned as the typical sign of blood stasis from the 1800s to the present in *Kampo*.^{1-4,7} Several studies have also showed the relationship between tenderness of the lower abdominal region and blood stasis.^{2,3,7} On the other hand, distended sublingual veins have been shown as a sign of blood stasis not only in *Kampo* but also in traditional Chinese medicine.^{2,3,6} Since the present study showed a significant and positive correlation between the appearance of sublingual veins and the level of *Sho fuku koh man*, we postulate that when combining *Fuku shin* and *Zetsu shin*, not only oriental medicine practitioners but also Western medicine practitioners could diagnose and treat blood stasis more easily and precisely in their daily clinical practice.

There are several limitations in the present study. Only one of the investigators scored the appearance of the veins, so there could be bias in the present results. However, we made sure that the 4-level classification of the sublingual vein scale showed high interrater agreement during the present study. We thus postulate that there would be a minimal bias, if any, on the *Zetsu shin* results. On the other hand, since *Fuku shin* (the abdominal exam) needs a lot of experience, tenderness of the patient's

lower abdomen was rated by only one well-experienced investigator, which might have induced a bias.

Conclusion

The relationship between the appearance of sublingual veins and a level of *Sho fuku koh man* showed a significant and positive correlation.

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Author Contributions

Young-Chang Arai conceived the study, participated in the study, and conducted all the experiments. Izumi Makino, Shuichi Aono, Makoto Nishihara, Tatsunori Ikemoto, and Keiko Owari conducted the acquisition of data. Young-Chang Arai helped draft the manuscripts. All authors read and approved the final manuscript.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical Approval

Approval was obtained from the Ethics Committee of Aichi Medical University (Reference Number: 13-097).

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