

Research Article

The Association between Varicose Vein of Lower Extremity and Tongue Exam

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Abstract

Blood stasis, 'oketsu', is a very important pathophysiological concept not only in Kampo but also in traditional Chinese medicine. Zetsu shin (the tongue exam) is the most important of the four diagnostic procedures in Kampo. Distended sublingual veins are known to reflect blood stasis after evaluation of their significance during diagnosis. One study indicated an association between 'oketsu' (impaired microcirculation and blood congestion) and varicose veins of the lower extremities. The aim of the present study was to determine the association between the severity of varicose veins and distended sublingual veins. All the diagnoses of varicose veins were made based on ultrasonographic results and severity was evaluated according to CEAP classification. One of the investigators rated the appearance of the veins on a scale from 0 to 3. There was a significant positive correlation between the severity level of varicose veins and the appearance of sublingual veins ($r_s = 0.3697$, $n = 40$, $p = 0.0189$). When we observe distended sublingual veins, indicating 'oketsu', special medical attention should be required for patients with varicose veins of the lower extremities because of the possibility of deep venous thrombosis on grounds of the present results.

Keywords: varicose vein of lower extremity; distended sublingual veins; oketsu; Zetsu shin

Introduction

Traditional Chinese medicine (TCM) and Kampo, traditional Japanese herbal medicine, developed a characteristic system [1-4]. Essentially, the system is made up of three dichotomies and three substance concepts. The three dichotomies are: Yin-You (ying-yang), Kyo-Jitsu and Netsu-Kan (translated in English as positive-negative, hollow-full and hot-cold, respectively). The three 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 closer to the common concepts of blood and body fluids, respectively. In not only TCM but also Kampo, the healthy state of human beings means a well-balanced or non-deviated condition of the three dichotomies and the three substances. When assessing disease due to deviation, specific diagnostic procedures are used [5].

Zetsu shin, the tongue exam, is one of the most important of the diagnostic procedures not only in Kampo but also in TCM [2,3,6,7]. Zetsu shin includes examination of the sublingual veins. Oketsu, which is a concept equivalent to blood stasis, including impaired microcirculation in Western medicine, is one of the pathological entities unique to Kampo and TCM. A pattern of blood stasis (oketsu) is often reflected by pathological deviations in the sublingual veins [3,6]. Especially, distended sublingual veins are known to precisely reflect blood stasis after an evaluation of their significance during diagnosis.

A study indicated an association between oketsu (impaired microcirculation and blood congestion) and varicose veins of the lower extremities [8]. However, few reports have studied the association between varicose veins of the lower extremities and the appearance of

sublingual veins. Thus, the aim of the present study was to determine the association between the severity of varicose veins and distended sublingual veins.

Methods

After obtaining approval from the Ethics Committee of Toki General Hospital, a cross-sectional survey from January 2017 to October 2017 was performed on patients with varicose veins of the lower extremities who visited our outpatient department. The exclusion criteria included patients with neurological deficit, coagulopathy or significant cardiovascular disease.

After obtaining written informed consent at their initial visit, all the diagnoses of varicose veins were made based on ultrasonographic results and severity was evaluated according to CEAP (clinical signs, etiologic classification, anatomical distribution, and pathophysiologic dysfunction) classification [9, 10]. The clinical component is scored from 0 to 6 and indicates increasing disease severity, ranging from none (0 points) to active ulcers (6 points). Then, 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 (Arai) rated the appearance of the veins on a scale from 0 to

3 (0: not distended, 1: slightly distended, 2: moderately distended, 3: markedly distended) (Figure 1). Three of the authors (Arai, Owari and Saisu) 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 ($k = 0.7-0.8$), we used the score rated by Arai as mentioned above.

First, we used Gpower software to determine the sample size for this study. An effect size means the strength of correlation between two variables. In the magnitude of the effect size in correlation, 0.3 and 0.5 mean medium and large effect size, respectively. The sample size required a minimum of 34 subjects to show an effect size of 0.4 with a significance level of 0.05 ($\alpha=0.05$) and a power of 80 % ($\beta=0.20$). Values are numbers or median [range]. The association between the appearance of sublingual veins and the score from CEAP classification was analyzed using Spearman’s rank correlation coefficient (r_s). A p-value of < 0.05 was considered significant.

Results

Patient’s characteristics are presented in table 1. There was a significant positive correlation between the severity level of varicose veins and the appearance of sublingual veins ($r_s = 0.3697$, $n = 40$, $p = 0.0189$) (Figure 2).

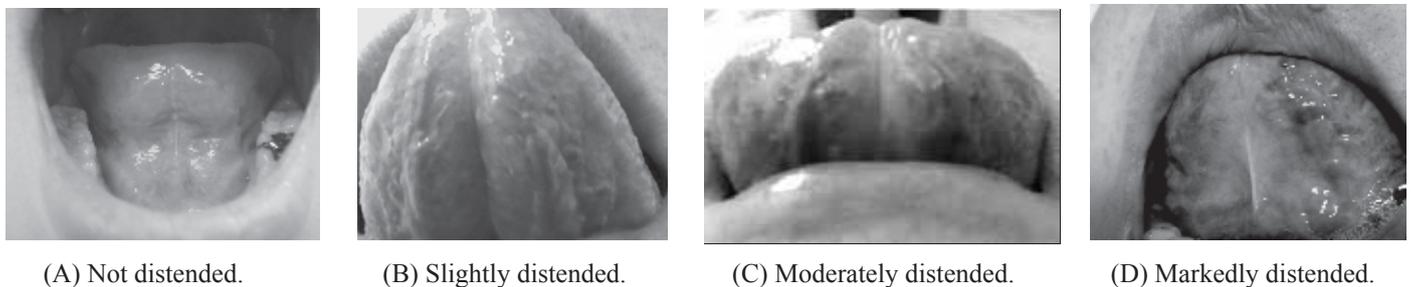


Figure 1. Zetsu shin, the tongue exam.

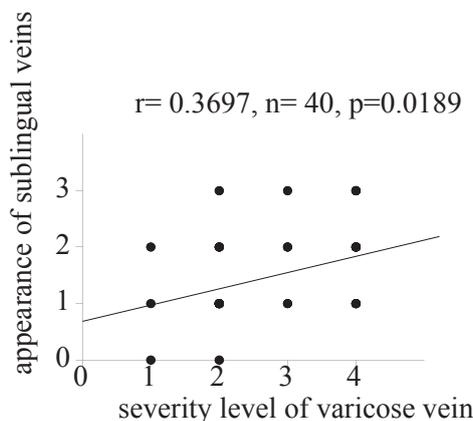


Figure 2. Scatterplot of the appearance of sublingual veins versus the severity level of varicose veins.

Discussion

The main finding of the present study was the significant positive correlation we observed between the appearance of sublingual veins and the severity level of varicose veins.

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, 11]. However, since a precise concept of blood stasis from the standpoint of western medicine has yet to be established [12], an objective standard for the diagnosis of blood stasis is useful, not only for western medical practitioners, but also for oriental medical practitioners.

There are the four diagnostic procedures that make up what is called in Kampo the four exams by which Kampo formula is prescribed for each individual [1-5]. Zetsu shin, the tongue exam, is one of the most important approaches of the four diagnostic procedures in Kampo. When administering Zetsu shin, we focus on the appearance of sublingual veins. Especially, 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]. Although one previous study indicated an association between oketsu (impaired microcirculation and blood congestion) and varicose veins of the lower extremities [8], the present study confirmed a significant and positive correlation between the appearance of sublingual veins and the severity level of varicose veins. Moreover, the study showed strong associations between varicose veins and deep venous thrombosis in a general practice population [13]. When we observe distended sublingual veins indicating impaired microcirculation and blood congestion, special medical attention should be required for patients with varicose veins of the lower extremities because of the possibility of deep venous thrombosis given the present results.

In conclusion, we found a significant positive correlation between the appearance of sublingual veins and the severity level of varicose veins.

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Author Contributions

Young-Chang Arai and Tatsunori Ikemoto conceived of the study, participated in its study, and conducted all

experiments. Jun Kawanishi Yusuke Imaeda; Hosokawa Keijiro; Yoshikazu Sakakima and Akihiro Ito conducted the acquisition of data. Young-Chang Arai; Keiko Owari and Hironori Saisu helped to draft the manuscripts. All authors read and approved the final manuscript.

Conflicts of Interest

All the authors declare that they have no competing interests.

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Ethical Approval

We obtained approval from the Ethics Committee of Toki General Hospital.

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