

## Acupuncture and Moxibustion Treatment for Diabetic Neuropathy

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Keywords: diabetes, diabetic neuropathy, numbness, tingling, oriental medicine, acupuncture and moxibustion

The number of patients with diabetes is increasing each year. Peripheral neuropathy is the most frequent manifestation of diabetes mellitus. Peripheral neuropathy is a complication that appears early in the course of the disease and is a major cause of impaired quality of life (QOL) of patients. Diabetes mellitus is caused by insufficient insulin secretion or decreased insulin sensitivity. Diabetes mellitus is characterized by impaired insulin action, resulting in elevated blood glucose levels and metabolic abnormalities. Blood glucose level is elevated, and if high glucose level is sustained over a long period of time, can lead to complications such as retinopathy, neuropathy, and nephropathy [1].

There are two types of diabetes mellitus: type 1 diabetes mellitus, in which insulin replacement is essential, and type 2 diabetes mellitus, in which insulin is not always essential. They differ not only in insulin secretion capacity but also in etiology. Type 1 diabetes is caused by a combination of genetic predisposition, viral infections and immune abnormalities. Type 2 diabetes is caused by a combination of

genetic predisposition and environmental factors such as excessive nutritional intake and lack of exercise. Type 2 diabetes is more common in obese people after middle age. In Japan, type 2 diabetes is common, with an estimated 8.9 million people suffering from diabetes and 13.2 million people suffering from pre-diabetes in FY2007.

Symptoms of diabetes mellitus include thirst, polydipsia, polyuria, general malaise, and weight loss, as symptoms of hyperglycemia. Symptoms of diabetic complications include diabetic retinopathy, vision loss due to cataracts, and numbness in the extremities due to neuropathy. Neuropathy is the most frequent complication and appears early in the course of the disease. Diabetic neuropathy results from the long-term persistence of metabolic abnormalities in diabetes mellitus [2]. They are broadly classified into three categories. Symmetrical peripheral polyneuropathy, mononeuropathic neuropathy, and autonomic neuropathy. In detail, the disease is classified into seven types [3]. They are polyneuropathy, diabetic muscle atrophy (proximal neu-

ropathy), diabetic radiculopathy, autonomic neuropathy, multiple mononeuropathy, mononeuropathy, and diabetic ocular muscle palsy.

In Oriental medicine, diabetes mellitus is included in the wasting-thirst. Wasting-thirst is generated by eating a lot of sweet foods and fatty foods, becoming terribly fretful, and often angry [4]. In the Yellow Emperor's classic of internal medicine, simple questions, on the chapter of strange disease, the person with this disease is always obese because he or she eats a lot of sweets and fatty foods. Obesity produces heat in the body, and sweetness distends the abdomen. It is written that the qi overflows, resulting in wasting-thirst.

In the Yellow Emperor's classic of internal medicine, spiritual pivot, on the chapter of five transformations, for all the five organs, the weak and tender ones are often ill and gradually lose weight. The weak organ is always matched by a strong organ. The strong organs are often angry, and the weak organ are easily hurt. A person who is disturbed by alcohol and has no moderation can also become wasting-thirst. In the essential prescriptions worth a thousand gold for emergencies, all people who drink alcohol get wasting-thirst. Drinking alcohol and having pleasure time will finally cause the triple energizer acts violently and the five organs are dried up. Diabetic neuropathy is thought to be caused by fire from stomach heat which generates pain and swelling throughout the body.

The wasting-thirst is divided into upper, middle, and lower wasting. The upper wasting belongs to the lungs. The main

symptom is extreme thirst and not being able to drink enough no matter how much one drinks. The middle wasting belongs to the spleen and stomach. The patient has a good appetite and feels hungry immediately after eating. Lower wasting belongs to the Kidney. The number and quantity of urination is high.

The efficacy of acupuncture in diabetic neuropathy has been shown to have a higher total effective rate with acupuncture than with oral inositol administration [5]. A comparison of acupuncture and sham acupuncture groups reported significant improvements in nerve conduction velocity in the acupuncture group [6]. In diabetic neuropathy, the effects of acupuncture on numbness and cramp-in-the-calf have also been reported [7]. Acupuncture treatment was performed once a week for a total of seven sessions. Acupuncture needles were placed for 15 minutes at the first treatment, and low-frequency electro-acupuncture were applied from the second treatment. The acupuncture points were GB34, LV3, SP9, and KI3. For hand symptoms, LI4 and LI10 were added. Acupuncture needles were Seirin 40-mm, No. 20 needles. For the evaluation of numbness, the mean value of visual analogue scale (VAS) of numbness after acupuncture treatment was obtained for 19 cases, using the maximum subjective symptom as 100 mm. the VAS decreased significantly from 46 mm at the first treatment to 25 mm at the eighth treatment. Cramp in the calf also often occurs. The incidence of cramps does not differ between males and females, and it is generally occur more often in the elderly [8]. In the mean frequency of the cramp in five patients, a statistically sig-

nificant improvement from eight times in the second examination to three times in the eighth examination was achieved. 12 out of 13 patients showed a decrease in the frequency of cramp. There were no statistical significant changes in the objective findings such as vibration sensation, or the touch test using monofilaments.

In discussion, the acupuncture points for diabetes described in the classics are compared with those for diabetic neuropathy to clarify their relationship to effect a radical cure of diabetes. The upper wasting was treated by draining on BL13, LU11, LU5, Ex-HN12, and Ex-HN13 [4]. The middle wasting was treated by draining on BL20, CV12, SP2, ST43, ST28. The lower wasting was supplemented with BL23 and CV4, and drained on KI1, KI2, KI7, and LR2. For all three wastings, draining on BL22 and TE4 are added. BL20 and SP2 drain heat of the spleen. CV12 and ST43 greatly drain fire of the stomach. ST28 cools large-intestine and stomach to remove heat and cure excessive heat in the triple energizer. As wasting-thirst is a lesion of the triple energizer, BL22 and TE4 are used to remove heat congestion in the triple energizer. If diabetes was classified as an endocrine disease, the following acupuncture points were used: TE4, CV12, left ST21, KI16, CV6, BL20, BL2, BL23, GV12, GV20, ST36 [9]. When diabetes was considered as an intractable disease, moxibustion was applied to SP9, LI11, BL20, and GV6 as specially effective acupuncture points [10]. CV12, ST19, BL18, BL20, BL22, GV20, BL10, LI11, ST36, SP8 or SP5 were also reported[11]. Diabetes mellitus corresponds to the middle and lower wastings. For the middle wasting, BL20, CV12, SP2, ST43, and ST28 are

used. For the lower wasting, BL23, CV4, KI1, KI2, KI7, LR2, BL22, and TE4 are used.

Electrical stimulation of the acupuncture point (ESA) was reported as 15 mm at SP8 (-) and 5 mm at SP5 (+) if there is a concomitant increase in appetite [12]. If the patient is less symptomatic, 15 mm should be used for ST37 (-). A combination of 5 Hz for 2 s and 100 Hz for 0.5 s of coarse-dense current stimulation was performed for 15 min. In the abdomen, ST21 (-) and ST25 (+), and in the back, BL20 (-) and BL22 (+), with 2 Hz of regular current stimulation for 10 minutes were used. The patient's pattern of meridian therapy is considered to be of the kidney deficiency spleen excess. The acupuncture points for diabetic neuropathy [7] were energized between GB34 and LV3 and SP9 and KI3. These acupuncture points are different from the acupuncture points for diabetes treatment. They are used by electro-acupuncture to the muscles innervated by the nerves that are affected by the neuropathy. Therefore, the main purpose is to alleviate the neuropathy, and the therapeutic effect on diabetes itself is not expected to be great.

There were reports that the treatment of diabetes mellitus was mainly dietary and medicinal therapy, with acupuncture and moxibustion as an adjunctive treatment [13]. There were also reported that severe diabetes mellitus that causes neuropathy was excluded from acupuncture and moxibustion treatment [14]. Acupuncture and moxibustion treatment may not restore blood vessels and nerves damaged by diabetes, so correct treatment at a medical institution is necessary. It is important to treat

acupuncture to improve numbness and sensory abnormalities while treating diabetes at a medical institution.

In summary, the number of diabetic patients is increasing every year. Among them, diabetic peripheral neuropathy is the most frequent manifestation. Neuropathy is a complication that appears early in the course of the disease and is a major cause of impairment of the patient's QOL. In Oriental medicine, diabetic neuropathy is thought to be caused by fire from stomach heat, which affects the whole body, resulting in pain and swelling. Acupuncture has been shown to be effective in patients with diabetic neuropathy, reducing the subjective symptoms of numbness caused by neuropathy. Cramp in the calf was improved in almost all patients. There were no statistical significant changes in the objective findings such as vibration sensation, or the touch test using monofilaments. The acupuncture points for diabetic neuropathy are different from those for diabetes mellitus and are not likely to lead to fundamental treatment of diabetes mellitus. On the other hand, acupuncture treatment for diabetic patients may be effective in improving QOL by improving numbness associated with neuropathy. Acupuncture treatment for diabetic neuropathy requires correct treatment at a medical institution because blood vessels and nerves damaged by diabetes may not be recovered. It is important to treat acupuncture to improve numbness and sensory abnormalities while treating diabetes at a medical institution.

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(Received 1 December 2017)



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