J. Biomed. Eng. Res : 39-46, 2006

A Study on the Artemisia Extract Moxibustion Method for the Diabetes

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(Received January 31, 2006. Accepted April 3, 2006)

Abstract

We have implemented the Artemisia Extract Moxibustion Method in order to improve the conventional moxibustion therapy. This method is aimed to eliminate burning wounds and smoke, which are the defects of conventional moxibustion therapy. We have verified the effectiveness of the method to the diabetes. We have performed a clinical test for the 23 cases of the diabetics. Level of FBS(fasting blood sugar) didn't show significant changes, but showed the tendency of the descent, and level of HbA1c significantly decreased after the treatments($P<0.001$)($n=19$).

Key words : artemisia extract, diabetes, moxibustion method, thermotherapy, pharmacological therapy

I. INTRODUCTION

Diabetes is treated with the acupuncture therapy in Oriental Medicine. The generally recommended acupuncture points for diabetes are Jogsamri(足三里, ST36), Jungwan(中脘, CV12), Gyeoksu (膈俞, BL17), Bisu (脾俞, BL20), Wisu (胃俞, BL21), and Chuesu (膵俞, a pair of extraordinary acupuncture points located at 1.5 cun(cun means about 2.75 cm) lateral to spinous process of the 8th thoracic vertebra).

But the moxibustion therapy has some demerits, that is to say, causing burn and fire. Furthermore, it is unsanitary as well.

Here, we have proposed the Artemisia Extract Moxibustion Method.

The moxibustion therapy has two kinds of effects: The formers are pharmacological effects of the Artemisia's vasodilators and antioxidants. The latters are thermal effects which cause improvement of blood circulation.

To remove the demerits without omission of above therapeutic effects, we have developedthe Artemisia Extract Moxibustion Method.

First, Artemisia-lotion was made by extracting the vasodilator and antioxidant compounds from the Artemisia-CH_2Cl_2 fraction. Second, the moxibustion kit that is composed of DC power supply, controller, Artemisia pad, and single or multiple heating terminal with PTC (Positive Temperature Coefficients) thermistor.

As we mentioned in our former researches ([2]~[8]) of the reference, the Artemisia Extract Moxibustion Method is superior in improvement of blood circulation to the indirect moxibustion therapy.

This paper has performed to verify the efficiency bythe questionnaire and the clinical test. We have treated the 23 cases of the diabetics with the routine medicines and the Artemisia Extract Moxibustion Method.

The result of the clinical test is that the 5 cases of the diabeticshas improved over 60% on the existing symptoms with pain, frequent urinate, thirst, weight loss, and languor sense of the whole body. Also, Level of HbA1c significantly decreased after the treatment ($P<0.001$)($n=19$)).

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II. MATERIALS AND METHODS

A. Artemisia Extract

The pharmacological procedure of Artemisia-lotion has the three process. First, Artemisia methanol was out of Artemisia and methanol. Second, Artemisia-CH_2Cl_2 and Artemisia-EtOAc fractionate was made out of the Artemisia methanol. At this time, Artemisia-CH_2Cl_2 ingredient got to included vasodilator, and Artemisia- EtOAc ingredient got to included antioxidant. Third, Artemisia extract essence made up out of the mixture to Artemisia-CH_2Cl_2 and Artemisia-EtOAc.

The Artemisia-lotion has been extracted as Fig. 1.

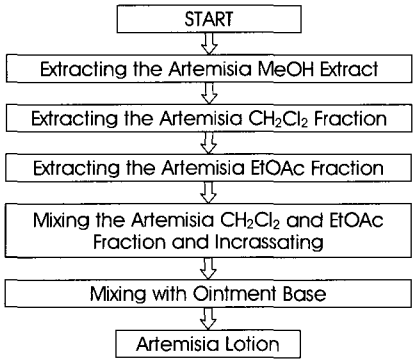


Fig. 1. The flowchart of making the Artemisia extract

B. Artemisia Extract Moxibustion Method

The moxibustion kit is composed of DC power supply (5 ~ 15[V] variable voltage) and thermo-transmit part. The thermo-generating part has used the PTC ($(Ba_{0.8}Sr_{0.2})_{0.996}Y_{0.004}TiO_3$+ 0.5WT$SiO_2$%, wide Φ12mm, thickness 1.1 mm ling type). Thermo-generating pads are to be classified into the single heating-pad and the multiple heating terminal. A single heating pad is composed of the PTC (Positive Temperature Coefficients) ceramic heater, and contact part of button type.

Fig 2 is the characteristic graph of the PTC($(Ba_{0.8}Sr_{0.2})_{0.996}Y_{0.004}TiO_3$+0.5WT$SiO_2$%, wide Φ12mm, thickness 1.1mm ling type) ceramic heater.

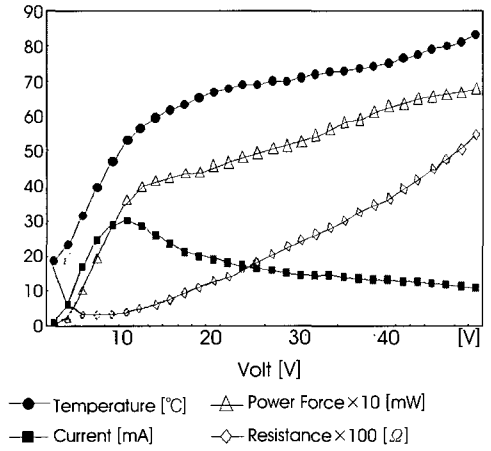


Fig. 2. The Characteristic graphs of the PTC ceramic heater

The PTC ceramic heater shows small temperature variation quantity for the varying voltage because of the positive temperature coefficient. Therefore the PTC ceramic heater is safe in the moxibustion Method.

Fig. 3 is the schematic diagram of single heating part and Artemisia-pad.

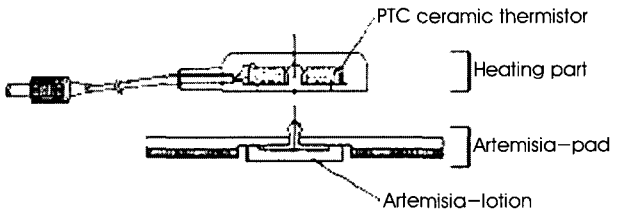


Fig. 3. The schematic diagram of single heating part and Artemisia-pad of Artemisia Extract Moxibustion Method

The single heating-pad has been designed for a spot on the body suitable for acupuncture point.

The single heating terminal is constructed with a PTC ceramic heater and with the contact part of button type for the accurate operation of spot on the body suitable for acupuncture.

Fig. 4 shows the temperature characteristics of the single heating terminal which generates heat for an acupuncture point.

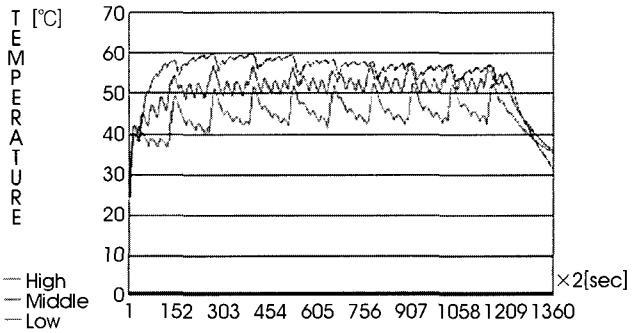


Fig. 4. The temperature characteristic graph of the single heating terminal

Fig. 5 is the schematic diagram of the multiple heating terminal and Artemisia-pad.The multiple heating pad is consisted with the 2 cross 3 matrix-type PTC(Positive Temperature Coefficients) ceramic heaters, the insulating materials, and the thermo-transmit boards.

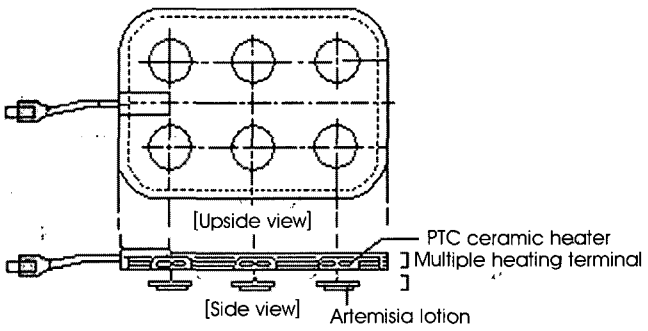


Fig. 5. The schematic diagram of the multiple heating terminal and Artemisia pad

The multiple heating terminal has been designed for a surgical operation about 65mm×95 mm body region. The PTC ceramic heaters are constructed at intervals of 2.5cm because of the acupuncture point interval.

Fig. 6 shows the temperature characteristics of the multiple heating terminal which generates heat for several acupuncture points at a region.

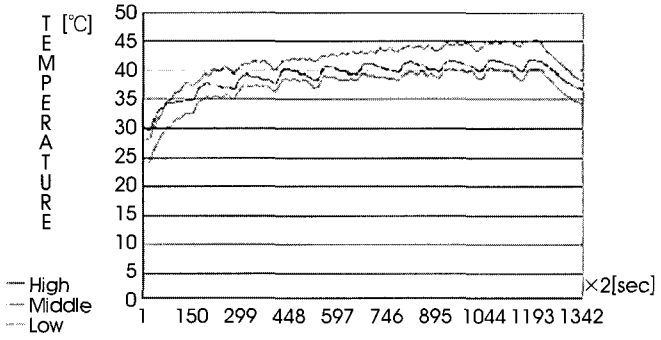


Fig. 6. The temperature characteristic graph of the multiple heating terminal

The multiple heating terminal is composed of the 6 PTC ceramic heaters and it is suitable for diabetes regional operation.

We have measure the emission power of far infrared rays with Artemisia pad and the PTC (Φ12 length 1.1mm cylindrical type) ceramic heater by FT-IR spectrometer.

Fig. 7 shows that the emission power value from the Artemisia pad was 4.19×10^{2}[w/m^{2} · μm, 50℃] by FT-IR Spectrometer.

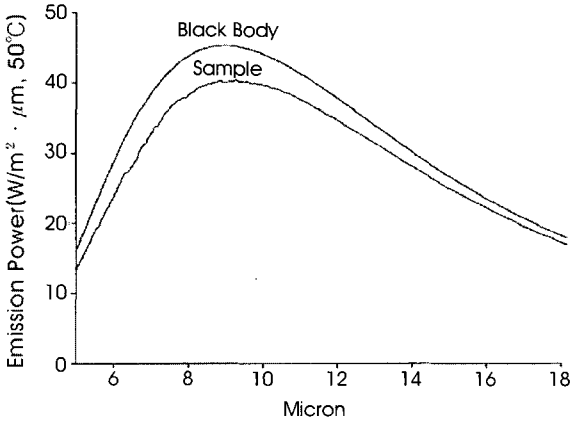


Fig. 7. The emission power of far infrared rays from the Artemisia pad

Fig. 8 shows that the emission power value of multiple heating terminal was 5.38×10^{2}[w/m^{2}μm, 50℃].

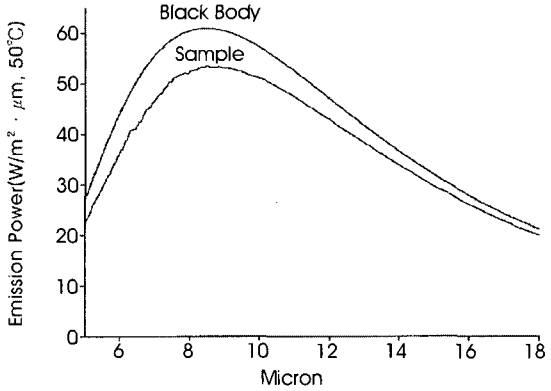


Fig. 8. The emission power of far infrared rays from the multiple heating terminal

C. Pre-Experiment with the Artemisia Extract Moxibustion Method

The spots on the body suitable for acupuncture of CV4 (Kwanwon), CV8 (Shinguel), and CV12 (Jungwan)have been treated frequently in the many surgical operation in the Oriental Medicine.

The pre-experiment has been done by stimulating the spot which were CV4, CV8, and CV12 acupuncture points of the Conception Vessel meridian (CV) and the stimulating time was one hour with Artemisia Extract Moxibustion Method.

Fig. 9 shows the trunk average temperature of body heat for the Artemisia Extract Moxibustion Method by thermograph.

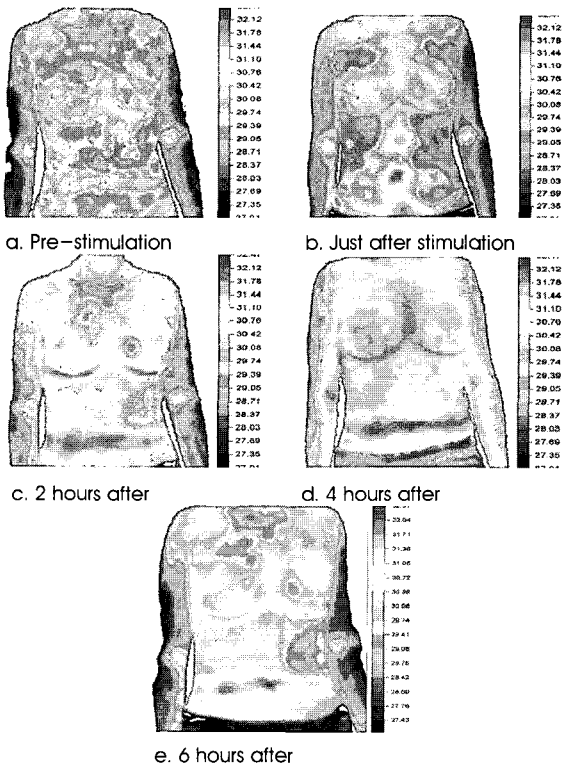


Fig. 9. The body heat thermograph of the subject(1 case)

Fig. 10 shows the trunk average temperature of body heat for the Artemisia Extract Moxibustion Method with the three single heating terminal stimulation, alsoshows the trunk average heat thermographs pre-stimulation, just after stimulation, 2 hours after, 4 hours after, and 6 hours after.

The trunk average heat was 28.5～29.5℃, the trunk average heat becomedecreased or increased by -0.5～1.2℃ just after stimulation, by -0.4～1.4℃ at 2 hours after, increased by 0.6～2.1℃ at 4 hours after, increased by 0.4～1.6℃ at 6 hours after.

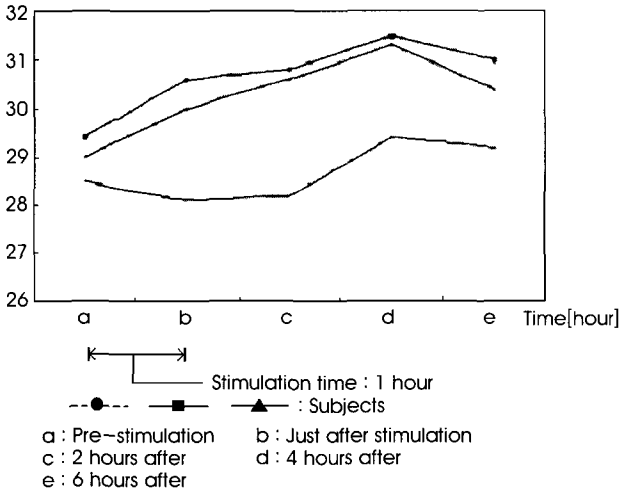


Fig. 10. The average trunk temperature of body heat with the subject(3 cases)

From that the trunk heats of all the subjects were increased after Artemisia Extract Moxibustion Method, we could verify that Artemisia Extract Moxibustion Method had two kinds of effects. The formers are pharmacological effects of the Artemisia-lotion; the latter are thermal effects which cause improvement of blood circulation.

Ⅲ. CLINICAL TESTS SUBJECTS & METHODS

A. Subjects

We had the clinical tests under the 23 cases of the diabetics in Hospital of Oriental Medicine Dong-Eui University. The subject conditions were one of the followings. 1) The subjects were men or women. The subjects were in the treatment of the drugs for the lower blood-sugar level or the insulin injection. 2) Their random blood-sugar levels were over 200mg/dl and they had the general symptoms of the diabetes. 3) Their empty stomachache blood-sugar levels were over 120mg/dl and they had the general symptoms of the diabetes. 4) They developed the complications of the diabetes.

B. Clinical Pathological Check-up Items and Times

The clinical pathological check-up items were the biochemistry check-up(LFT, BUN, CREAT-ININE, HbA-1c, Lipid profile, Glucose) and urine check- up(Protein, Glucose, Bilirubin, p.h, Ketton, Blood, Nitrite, S.G, LUE). Check-up times were pre-treatment and after treatment.

C. Therapeutics

The diabetics are treated with the moxibustion therapy in Oriental Medicine. The generally recommended acupuncture points for diabetes are Jogsamri(足三里,ST36), Jungwan(中脘, CV12), Gyeoksu (膈兪, BL17), Bisu (脾兪, BL20), Wisu (胃兪, BL21), and Chuesu (膵兪, a pair of extraordinary acupuncture points located at 1.5 cun(cun means about 2.75 cm) lateral to spinous process of the 8th thoracic vertebra).

We took the operations with the Artemisia extract and the heating terminals. The Artemisia extract was 3% concentration, and the heating temperature was 43℃ default.

D. A Questionnaire

We made up a question on concerning the diabetes and the complications of the diabetes.

The diabetes questionnaire were consisted of the general symptoms and the detailed symptoms such as thirsty, much water drinking, decreased weight, losing appetite, weariness, ineffectualness, night sweating profusely, breast heavy, insomnia, constipation.

E. The Complications Questionnaire

The complications questionnaire were consisted of the general symptoms and the detailed symptoms such as the blood vessel disease of lower limbs, a peripheral nerve disease, a diabetic retina disease, kidney and bladder disease, skin disease.

F. The Level of Improvement

We asked the subjects the levels of improvement.

The subjects chose improvement, effacement, and unchanged after treatment.

G. Statistics

We used the paired sample T-test. And we did comparative analysis about improvement before and after treatment. We regarded it meaningful that the value of P is less or equal to 0.05.

We analyzed the urinalysis level that was0, ± was 1, + was 2, ++ was 3, +++ was 4, and ++++ was 5, and executed the statistic analysis with SPSS Window10.0.

Ⅳ. RESULTS AND DISCUSSION

Sex and Age

Total subjects were 23 cases. 13(56.5%) cases were male, and 10(43.5%) cases were female.

The age of the subject was 14~77, and the average age was 56(Table 1).

Table 1. Sex and Age Distribution

Age	Sex		Total
(years)	Male	Female	
14~49	1	1	2
50~59	8	5	13
60~69	2	3	5
70~77	2	1	3
Total	13(56.5%)	10(43.5%)	23

Clinical History of Family and the History of a Case

The clinical history of the diabetic subjects was 1~3 3 years, and the average was 8.4 years(Fig. 11a).

The patients with the clinical family history of the diabetes were 6(26.1%) cases, and the patients with diabetic clinical history were 8 cases(Fig. 11b). In the above 8 cases, 7(87.5%) cases suffered the hypertension and 1(12.5%) paralysis(Fig. 12a).

Existing Treatments

The existing treatments were the blood sugar dropping medicine(15 cases), the insulin injection(2 cases), the insulin pump (1 cases), and no treatment was 5 cases(Fig. 12b).

And the existing treatment continued to add with Artemisia Extract Moxibustion Method under clinical test.

A. The Questionnaire for Symptoms

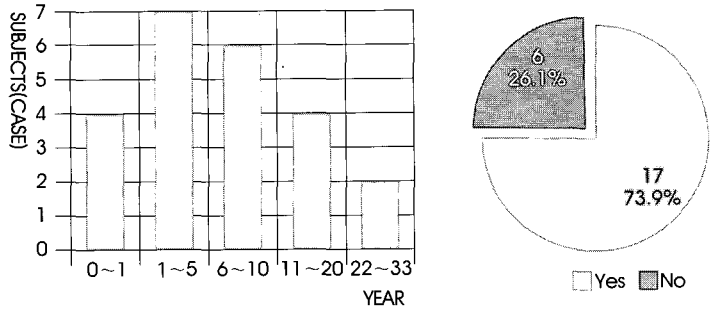
The Diabetic Complication

The subjects of the sore symptoms of upper and lower limbs were 17 cases, and in the 17 cases, 15 cases were the paresthesia, the 7 cases were clonic pain, 1 case was the death of instep.

—After the Moxibustion Method

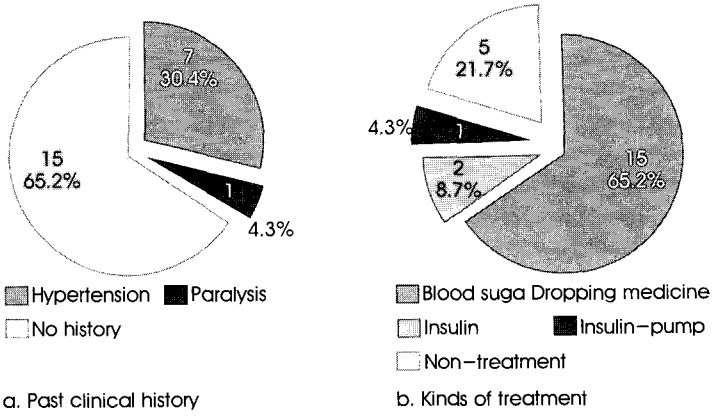
In the 15 cases of paresthesia, 1 case was effacement, 9 cases were improvement, 5 cases were unchanged. In the 7 cases of clonic pain, 4 cases were improvement, 3 cases were unchanged. 1 case of the instep death was effacement.

Therefore, the subjects of improvement were 10 cases, and the instep death was effacement, the worse of symptoms was 0 case.



a. Duration of Disease b. Family History

Fig. 11. Duration of Disease and the Family History



a. Past clinical history b. Kinds of treatment

Fig. 12. Past clinical history and the Kinds of treatment

– The Symptoms of Eye

The patients of eye diseases were 10 cases.

– After the Moxibustion Method

1 case was improved, 9 cases were unchanged.

Kidney and Bladder Symptoms

The subjects of the kidney and bladder symptoms were 16 cases, and among them, 7 cases were frequent urination, 3 cases were incontinence of urine, 2 cases were sexual dysfunction, 5 cases were hypo-sexuality.

– After the Moxibustion Method

In the 7 cases of frequent urination, 2 cases were effacement, 4 cases were improved, 1 case was unchanged. 3 cases of the urine incontinence were unchanged. In the 2 cases of sexual dysfunction, 1 case was effacement, 1 case was improved. 5 cases of hypo-sexuality were unchanged. And the worse subject wasn't.

The Generalized Symptoms

The generalizedsymptoms were the spontaneous perspiration (8 cases), the creeping chill(5 cases), the oppressed feeling in the chest(2 cases), the insomnia(3 cases), the constipation(1 case), and the anorexia(2 cases).

– After the Moxibustion Method

In the 8 cases of spontaneous perspiration, 5 cases were improvement, 3 cases were unchanged. The 2 cases of the oppressed feeling in the chest were unchanged. In the 3 cases of insomnia, 1 case was improvement, 2 cases were unchanged. The 1 case of anorexia were improvement. And the worse subject wasn't(Table 2).

Other Symptoms

The other symptoms were the skin troubles(9 cases), the gingivitis(5 cases), the auditory disorder(2 cases), and the tinnitus (1 case)(Table 3).

– After the Moxibustion Method

In the 9 cases of skin troubles, 1 case was improved, 8 cases were unchanged. The 5 cases of gingivitis were unchanged. In the 2 cases of auditory disorder, 1 case was improved, 1 case was unchanged. The 1 case of tinnitus was improved. And the worse subject wasn't after moxibustion treatment.

Table 2. Diabetes mellitus complication 1

	Symptoms		Improve Grade		
limb	Paresthesia	15	Eff.*	1	10 (66.6%)
			Imp.**	9	
			Unch.***	5	5(33.4%)
	Pain	7	Eff.	0	4(57.1%)
			Imp.	4	
			Unch.	3	342.9%)
	Necrosis	1	Eff.	1	1(100%)
			Imp.	0	
			Unch.	0	0(0%)
	eye	10	Eff.	0	1(10%)
			Imp.	1	
			Unch.	9	9(90%)
Kidney Bladder	Frequent urination	7	Eff.	2	6(85.7%)
			Imp.	4	
			Unch.	1	1(14.3%)
	Incontinence of urine	3	Eff.	0	0(0%)
			Imp.	0	
			Unch.	3	3(100%)
	Sexual dysfunction	2	Eff.	1	2(100%)
			Imp.	1	
			Unch.	0	0(0%)
	Hypo-sexuality	6	Eff.	0	0(0%)
			Imp.	0	
			Unch.	5	5(100%)
Genera-lized	Spontaneous perspiration(自汗)	8	Eff.	0	5(62.5%)
			Imp.	5	
			Unch.	3	3(37.5%)
	Creeping chill	5	Eff.	0	1(20%)
			Imp.	1	
			Unch.	4	4(80%)
	Oppressed feeling in the chest	2	Eff.	0	0(0%)
			Imp.	0	
			Unch.	2	2(100%)
	Insomnia	3	Eff.	0	1(33.3%)
			Imp.	1	
			Unch.	2	2(66.7%)
	Constipation(便秘)	1	Eff.	0	1(100%)
			Imp.	1	
			Unch.	0	0(0%)
	Anorexia	2	Eff.	0	2(100%)
			Imp.	2	
			Unch.	0	0(0%)

*:effacement, **:improvement, ***:unchanged

Table 3. Diabetes mellitus complication 2

Symptoms			Improve	Grade	
Others	Skin trouble	9	Eff.	0	1(11.1%)
			Imp.	1	
			Unch.	8	8(88.9%)
	Gingivitis (齒齦腫痛)	5	Eff.	0	0(0%)
			Imp.	0	
			Unch.	5	5(100%)
	Auditory disorder	2	Eff.	0	1(50%)
			Imp.	1	
			Unch.	1	1(50%)
	Tinnitus	1	Eff.	0	1(100%)
			Imp.	1	
			Unch.	0	0(0%)

B. The Asking and Answering for the Diabetic Clinical Symptoms

The clinical manifestations were the thirst(8 cases), the frequent drinking of water(2 cases), the decrease of body weight(6 cases), the polyphonies with frequent hunger(2 cases), the malaise(10 cases).

After the Moxibustion Method

In the 8 cases of thirst, 2 cases were effacement, 3 cases improved, 3 cases were unchanged. The 2cases of the frequent drinking of water were effacement. In the 6 cases of the decrease of body weight, 3 cases were effacement, 1 case was improved, 2 cases were unchanged. The 2 cases of polyphonies with frequent were improved. In the 10 cases of malaise, 1 case was effacement, 6 cases were improved, 3 cases were unchanged. Also, the worse subject wasn't(Table 4.).

Table 4. Clinical manifestation

Symptoms		Improve	Grade	
Thirst	8	Eff.	2	5(62.5%)
		Imp.	3	
		Unch.	3	3(37.5%)
Frequent drinking of water	2	Eff.	2	2(100%)
		Imp.	0	
		Unch.	0	0(0%)
Decrease of body weight	6	Eff.	3	4(66.7%)
		Imp.	1	
		Unch.	2	2(33.3%)
Polyphagia with frequent hunger	2	Eff.	0	2(100%)
		Imp.	2	
		Unch.	0	0(0%)
Malaise(倦怠感)	10	Eff.	1	7(70%)
		Imp.	6	
		Unch.	3	3(30%)

C. Pathologic Test

The 19 cases took the biochemical check-up after the moxibustion treatment. The average values of check-up were as following. The HbA1c average of before treatment was 8.400%, and after treatment 7.632%. The HbA1c average was decreased significantly after treatment($P<0.001$). The urinary blood average of before treatment was 0.73, and after treatment 0.27. The urinary blood average was decreased significantly after treatment($P<0.001$). In addition, the FBS average before treatment was 182.64 mg/dl, after treatment 161.77 mg/dl. These values didn't show the significance but the tendency to decrease.

Ⅵ. CONCLUSION

We have implemented the Artemisia Extract Moxibustion Method in order to get rid of the burnt, fiery, unsanitary problems of the conventional moxibustion therapy.

We had the diabetic symptoms questionnaire and the clinical tests under the 23 cases of the diabetics in Hospital of Oriental Medicine Dong-Eui University. And we have verified that our proposed moxibustion method was a significant treatment method.

From the results of symptoms questionnaire, we have verified the improvement over 60% the symptoms that were the upper and lower limbs pain, frequent urination, spontaneous perspiration, thirst, decrease of body weight, and malaise after the moxibustion treatment on 5 cases among 23 cases.

The 19 cases took the biochemical check-up after the moxibustion treatment. From the results of biochemical check-up, the average HbA1c of before treatment was 8.400%, and after treatment 7.632%. The average HbA1c was decreased significantly after treatment ($P<0.001$). And the average urinary blood of before treatment was 0.73, and after treatment 0.27. The average urinary blood was decreased significantly after treatment ($P<0.001$). In addition, the average FBS before treatment was 182.64 mg/dl, after treatment 161.77 mg/dl.

Therefore, from the results of this study, we could verify the effectiveness of the Artemisia Extracted Moxibustion Method for the diabetes.

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