Japanese Acupuncture - Current Research

Effects of Acupuncture Treatment on Osteoarthritis of the Knee

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Introduction

Today, Japan boasts one of the longest average lifespans in the world, but only 60 years ago it was considered an accomplishment in Japan to live to the age of 50. This recent sudden increase in average lifespan, both in Japan and around the world, means that the profile of disease in our modern age is very different from that when the ancient medical texts on acupuncture were written. It seems likely that diseases associated with joint deformation, muscle atrophy, and a general reduction in the capacity to heal were less common at that time than they are in modern society. That being the case, we need to take a new look at the degenerative diseases that we see so often around us today.

In these pages we will discuss osteoarthritis of the knee, a typical example of degenerative disease that acupuncturists are often asked to treat. We will present research that offers perspectives for effective treatment regimens, and provide information on indications for acupuncture treatment and the limitations of that treatment.

Research to date

Across the ages, both in Asia and in the West, there have been numerous books and articles stating that acupuncture is "very effective." However, frank and objective commentary is rare.

Among the relatively recent reports on treating osteoarthritis of the knee in Japan, we have Hirohisa Yoneyama's comments. In the 1980s he stated, "Conditions such as osteoarthritis require prolonged medical treatment, and in such cases, acupuncture treatment can sometimes be used as adjunct therapy. However, from the viewpoint of medical management, chronic disease is very difficult to cure completely, and only after the acupuncturist and the patient have developed a relationship of trust and mutual cooperation should acupuncture therapy be initiated for joint pain." Yoneyama offers an objective assessment of treatment methods and of the limitations of acupuncture treatment.

Masato Nakao noted that, "Acupuncture is often quite effective in relieving pain ... and can be extremely useful in treating pain that does not respond to drug therapy. However, acupuncture appears to be almost completely ineffective in preventing or relieving muscle atrophy and joint contracture, which is probably one of the reasons for the generally poor therapeutic outcome for acupuncture in the treatment of advanced osteoarthritis of the knee. There are thus some situations in which other treatment options should be aggressively pursued." Nakao, while supporting the usefulness of acupuncture, believes that therapeutic effectiveness is reduced by the presence of advanced osteoarthritis and muscular atrophy, and recommends countermeasures involving the concomitant use of rehabilitation medicine and other indicated therapies.

The report by Hideki Ochi and colleagues, presented in this issue, describes their tests to determine the scientific validity of the opinions expressed by acupuncture practitioners.

1. The importance of adjunct use of exercise therapy

Research design

(*Fig. 1 Treatment administered, treatment period, diagram of acupuncture points*)

Ochi and colleagues found that the effectiveness of acupuncture treatment for osteoarthritis of the knee was increased by the adjunct use of exercise therapy (quadriceps training). They proved this by performing the comparative study described below. Subjects were patients who had been diagnosed with osteoarthritis of

the knee. Enrolled subjects were divided into three groups: one group receiving acupuncture only, one group receiving acupuncture in combination with exercise therapy, and one group receiving exercise therapy without acupuncture. Researchers compared the effects of each of these treatments, using the indicators of extended muscle strength and joint function. They scored joint function in four different categories: ability to walk on a flat surface, ability to climb stairs, angle of knee flexion, and swelling of the knee joint, from 100 points (normal) to 0 points.

Subjects: Patients diagnosed with primary osteoarthritis of the knee.

48 patients (48 joints) in whom the extent of joint deformation was considered early-stage or mid-stage on the basis of x-ray findings.

Mean age was 64 ± 7.0 years.

Of these patients, 18 were treated with acupuncture alone, 20 with acupuncture and exercise therapy, and 10 with exercise therapy alone; and results were analyzed.

(Fig. 2 Bar Graph of Joint Function, Fig. 3 Bar Graph of Muscle Strength).

The results showed a statistically significant increase in extended muscle strength in the groups treated with exercise therapy, but not in the group treated with acupuncture alone.

The groups treated with acupuncture showed obvious improvement in overall knee function, while the group treated with exercise alone showed no clear improvement in this area.

Those findings indicated that a combination of acupuncture and exercise therapy provides a more favorable prognosis for osteoarthritis of the knee than either acupuncture treatment or exercise therapy alone.

2. Extent of knee defromation and the effectiveness of acupuncture therapy

Research design

After determining that a combination of acupuncture treatment and exercise therapy was effective for osteoarthritis of the knee (see above), Ochi and colleagues suspected that treatment effectiveness might vary for different levels of joint deformation. To confirm this, they performed the following comparative study. Their selected subjects were patients diagnosed with osteoarthritis of the knee, in whom knee joint x-ray findings showed initial deformation ranging from barely detectable to visible loss of tibial joint surface. Knee joints were classified by disease stage in order of severity ("early stage", "mid stage", and "late stage"). Therapeutic effects were investigated and compared for each of those stages.

Subjects: 25 patients with primary osteoarthritis of the knee (25 joints).

Mean age was 66 ± 9.0 years.

The subjects were early stage in 10 cases, mid stage in 7 cases, and late stage in 8 cases. Major findings were analyzed.

(Fig. 4 Bar Graph of Joint Function, Fig. 5 Bar Graph of Muscle Strength)

Results confirmed that knee function and strength were both reduced with increasing deformation. Acupuncture treatment in combination with exercise therapy produced some improvement in both strength and function, regardless of the extent of deformation present. However, the more severe the deformation, the greater the extent of loss of function and muscle strength at treatment baseline. The severe cases showed some improvement, but not enough to allow the patients in that category to return to daily activities. This makes it particularly important to explain the limitations of acupuncture therapy to patients who show pronounced joint deformation (informed consent) before initiating treatment.

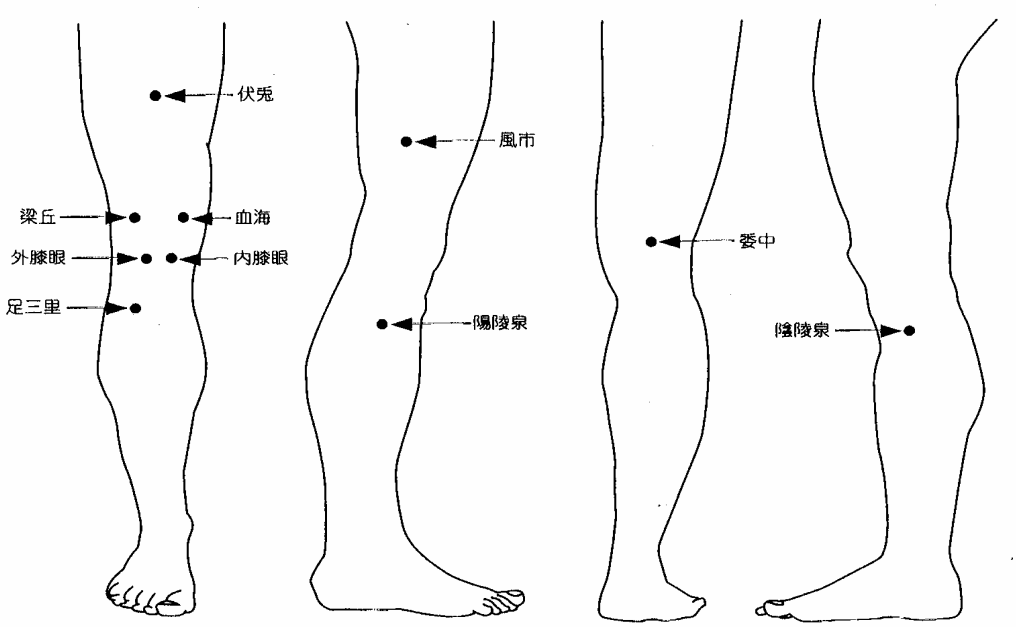
Analysis of results

This report is based on the results of treatment performed for only one month, a relatively short period for research on a chronic condition. However, the study illustrates the following points regarding the

treatment of osteoarthritis of the knee:
(1) The combination of acupuncture treatment and exercise therapy (quadriceps training) appears to be more effective than acupuncture alone, and
(2) In cases of pronounced deformation of the knee, it is unlikely that acupuncture will provide clinically significant improvement in either joint function or muscle strength.

Ochi and colleagues emphasized the importance of obtaining fully informed consent before giving acupuncture treatment to patients with advanced deformation of the knee joint. They do not specifically discuss methods of obtaining informed consent.

We understand that while acupuncture treatment can be useful for managing degenerative diseases associated with aging, acupuncture is rarely curative for such conditions. It is important to explain this clearly to patients. In Japan the middle-aged and elderly account for a high percentage of acupuncture patients, many of whom continue acupuncture treatment for 10 or 20 years, or even longer, as part of their personal self-care program. Fumihiko Shirota stated that, "Health usually deteriorates with age, and patients come in with the objective of not getting any worse after their first visit. But actually that is an unrealistic goal."



Treatment interval: In general, once or twice a week
Needle used: 40 mm 18 gauge stainless steel
Needling locations and techniques
Points: Sparrow-pecking technique at ST32, SP10, ST34, EX-LE4, Outer Eye of the Knee, GB31, ST36, SP9, GB34, and BL40.
・10 minutes of SSP (silver spike point) therapy (compression wave, 3 to 20 Hz) applied to the rectus femoris muscle and the medial joint space.
Note: (SSP therapy): A form of low frequency electrotherapy in which conical shaped silver-plated electrodes (SSP electrodes) are positioned on the surface of the skin, secured with adhesive tape, and used to deliver a low frequency electrical current.
Exercise therapy
Quadriceps training (patella setting exercise and straight leg raises), performed in sets of 20 to 30 repetitions, using 1 to 2 kg weights, 3 sets per day.
Treatment period: 4 weeks. In general, treatment is performed one to two times a week.

Fig. 1 Treatment Method

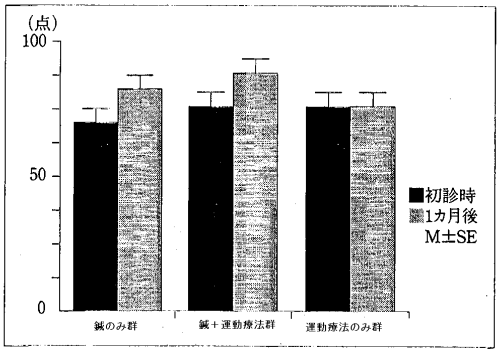


図２　膝関節機能

Fig. 2 Knee Joint Function
Group treated with acupuncture only
Acupuncture + Exercise therapy
Exercise therapy only
Initial visit
After 4 weeks

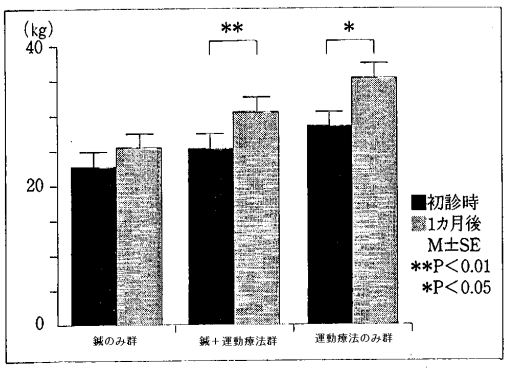


図３　膝伸展筋力

Fig. 3 Knee Extension Strength
Group treated with acupuncture only
Acupuncture + Exercise therapy
Exercise therapy only
Initial visit
After 4 weeks

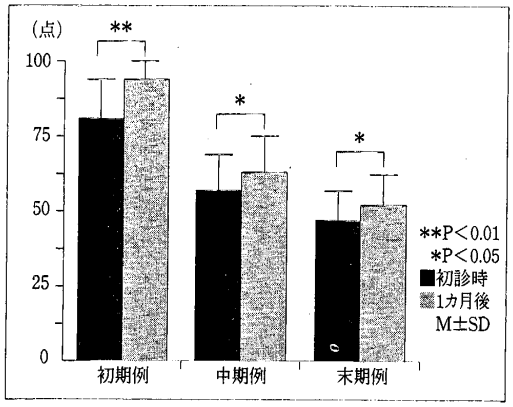


図４　膝関節機能

Fig. 4 Knee Joint Function
Early stage group
Mid stage group
Late stage group
Initial visit
After 4 weeks

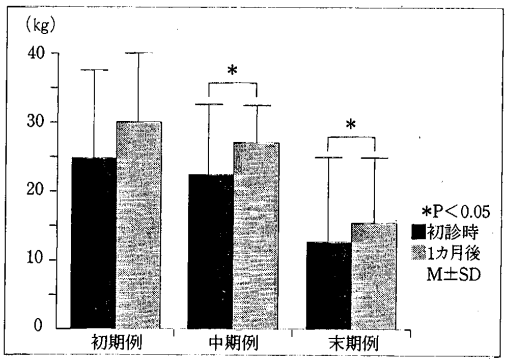


図５　膝伸展筋力

Fig. 5 Knee Extension Strength
Early stage group
Mid stage group
Late stage group
Initial visit
After 4 weeks

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- Literature cited
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  Author: Hideki OCHI
  Affiliation: Clinical Acupuncture Medicine Dept. II, Meiji Acupuncture University
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2) Nakao M Acupuncture in the treatment of osteoarthritis of the knee. *The Journal of Acupuncture and Moxabustion,* No. 557, p. 118, 1991, Ido-no Nippon Sha
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1. Pain, ability to walk	
Able to walk a distance of 1 km or more. Ordinarily no pain, experience of pain on exercise acceptable.	30 points
Able to walk a distance of 1 km or more, pain present.	25 points
Able to walk at least 500 m but less than 1 km, pain present.	20 points
Able to walk at least 100 m but less than 500 m, pain present.	15 points
Able to walk indoors, or less than 100 m, pain present.	10 points
Unable to walk.	5 points
Unable to stand.	0 points
2. Pain, ability to go up and down stairs	
Able to go up and down stairs freely, no pain.	25 points
Able to go up and down stairs freely, no pain. Need to use handrail, no pain.	20 points
Need to use handrail, pain present. Need to go step by step, no pain.	15 points
Need to go step by step, pain present. Need to use handrail and go step by step, no pain.	10 points
Need to use handrail and go step by step, pain present.	5 points
Cannot go up and down stairs.	0 points
3. Angle of knee flexion and ankylosis/extreme joint contracture	
Able to sit in a kneeling position with legs folded under the body.	35 points
Able to sit in a kneeling position with legs to the side, or to sit cross-legged.	30 points
Knee can bend at an angle of at least 110°.	25 points
Knee can bend at an angle of at least 75°.	20 points
Knee can bend at an angle of at least 35°.	10 points
Knee can bend less than 35°, or ankylosis/extreme joint contracture present.	0 points
4. Swelling	
No swelling or fluid	10 points
Occasional needle aspiration required	5 points
Frequent needle aspiration required	0 points

Table Clinical Course of Osteoarthritis of the Knee (according to Koshino)

Extent of deformation	No. of cases	Assessment method	Initial visit	→	4 weeks	Difference
Early stage group	10 patients	JOA score	82.0 points	→	94.5 points	12.5 points improvement
		Knee extension strength	25.7 kg	→	29.7 kg	4.0 kg improvement
Mid stage group	7 patients	JOA score	57.9 points	→	65.5 points	7.6 points improvement
		Knee extension strength	22.4 kg	→	27.3 kg	4.8 kg improvement
Late stage group	8 patients	JOA score	43.8 points	→	53.1 points	9.3 points improvement
		Knee extension strength	11.3 kg	→	15.9 kg	4.6 kg improvement

Early stage: Images show only bone spurs and osteosclerosis, with weight-bearing x-ray showing no narrowing of the joint space.
Mid stage: Narrowing or elimination of the joint space can be observed.
Late stage: Friction wear or loss of tibial joint surface evident.

Table

Extent of deformation	No. of cases	Assessment method	Initial visit	→	4 weeks	Difference
Group treated with acupuncture only	18 patients	JOA score	71.1 points	→	85.6 points	14.4 points improvement
		Knee extension strength	22.6 kg	→	24.8 kg	2.2 kg improvement
Acupuncture + Exercise therapy	20 patients	JOA score	81.0 points	→	92.3 points	11.3 points improvement
		Knee extension strength	25.3 kg	→	31.5 kg	6.2 kg improvement
Exercise therapy only	10 patients	JOA score	80.0 points	→	81.0 points	1.0 points improvement
		Knee extension strength	28.7 kg	→	34.9 kg	6.2 kg improvement

* All groups except for those receiving acupuncture alone showed a statistically significant increase in knee extension strength ($p < 0.05$ - 0.01).