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THE ANALGESIC EFFECT OF ACUPUNCTURE IN CHRONIC TENNIS ELBOW PAIN

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SUMMARY

The immediate analgesic effect of a single non-segmental acupuncture stimulation treatment on chronic tennis elbow pain was studied in a placebo-controlled single-blind trial completed by 48 patients. Before and after treatment, all patients were examined physically by an unbiased independent examiner. Eleven-point box scales were used [13] for pain measurement. Patients in the verum group were treated at non-segmental distal points (homolateral leg) for elbow pain following Chinese acupuncture rules, whereas patients in the placebo group were treated with placebo acupuncture avoiding penetration of the skin with an acupuncture needle. Overall reduction in the pain score was 55.8% (S = 2.95) in the verum group and 15% (S = 2.77) in the placebo group. After one treatment 19 out of 24 patients in the verum group (79,2%) reported pain relief of at least 50% (placebo group: six patients out of 24). The average duration of analgesia after one treatment was 20.2 h in the verum group (S = 21.54) and 1.4 h (S = 3.50) in the placebo group. The results are statistically significant ($P<0.01$); they show that non-segmental verum acupuncture has an intrinsic analgesic effect in the clinical treatment of tennis elbow pain which exceeds that of placebo acupuncture.

KEY WORDS: Acupuncture, Pain treatment, Tennis elbow.

ACUPUNCTURE has a growing reputation, especially as a treatment for pain. In recent years basic scientific research has revealed certain neuro-physiological reactions to acupuncture (e.g. increase in β-endorphins in the lumbar spine [4, 29, 30] and increase in 5-hydroxytryptophan levels in the cerebrum [7]) which partly explain the analgesic effect of acupuncture [2, 8–11, 17, 18, 23–26, 31, 34]. Tennis elbow often shows only minor improvement following conventional orthopaedic therapies such as corticoid injections, plaster cast fixation or physiotherapy [5, 12, 14].

METHOD

Patients

Forty-eight patients, all volunteers, were enrolled in the trial after satisfying the following criteria: chronic unilateral tennis elbow pain for more than 2 months, no current therapy involving pain killers, no systemic bone and joint disorders (e.g. RA), no previous treatment with acupuncture, no overt psychiatric illness, the ability to speak, read and write German. All patients were informed about the trial and written consent was obtained. Patients enrolled in the trial were allocated randomly to either the verum or placebo groups. Care was taken that the patients all had identical information about the trial so that they could not detect to which treatment group they belonged.

Hypothesis to be tested

In the case of tennis elbow pain the immediate analgesic effect of acupuncture after one treatment does not exceed that of placebo acupuncture. The criterion for successful treatment was pain relief of 50% or more (pain measurement with 11-point box scales).

Sample size

On the basis of our own experience as well as in reviews of published acupuncture trials, pain relief of 70% after verum acupuncture and 30% after placebo acupuncture was expected [16, 28, 32, 33]. From Fleiss's tables it was ascertained that to have a Type I error risk of less than 0.05, and a power of 0.90, 72 patients would be required for the trial [6]. The design schedule was designed so that the gathered data could be subjected to sequential analysis, done blind to the investigator; the trial was to be stopped as soon as significantly different results between both groups with a Type I error risk of less than 0.01 were obtained.

Assessment prior to treatment

Personal data and details of the patient's medical history and presenting condition, as well as attitude towards acupuncture, were obtained during a semi-structured interview conducted by an independent unbiased examiner (an orthopaedic doctor of the clinic), not the acupuncturist. The same examiner assisted the patient in evaluating his or her personal pain level by physical assessment of the elbow with respect to pressure, load, or movements of the forearm which were causing elbow pain. All data were recorded on a questionnaire containing 11-point box scales, which consist of 11 numbers (0–10). The patient was told that 0 represented the one extreme 'no pain at all', and that 10 represented the other extreme 'pain as severe as it could possibly be' and was asked to place a × symbol through the number representing his or her pain level. This number was the patient's pain score.

Treatment of the verum group

The treatment was carried out by the first author, an

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orthopaedic doctor, trained in Chinese acupuncture. In one single acupuncture treatment, patients of the verum group were treated at a non-segmental distal point on the fibulatibial joint of the homolateral leg (GB 34 *Yanglingquan*) [1, 15, 32]. The depth of insertion was 2 cm and the needle was manipulated manually until the patient felt a dull feeling of pressure and warmth around the needle (*DE Qi*). During needling, the patient was asked to move the painful arm. Patients were treated for a total of 5 min. The painful area of the elbow itself was not needled.

Treatment of the placebo group

Since needling the patient at any point whatsoever must be judged as a form of acupuncture, which raises the β-endorphin level (so-called sham acupuncture) we decided to refrain from inserting a needle in any patients in the placebo group, thus exclusively using a suggestive therapy [7, 16, 28, 33].

Patients in the placebo group were positioned on a chair in a relaxed position. They received the same information about the acupuncture trial as the patients in the verum group and the treatment was carried out by the same person as in the verum group. Before treatment, each patient was shown an acupuncture needle. A point 1.5 cm lateral to the third thoracic vertebra [acupuncture point UB 13 (*Feishu*)] on the patient's back was stimulated with a pencil-like probe, the insertion of a needle thus being feigned. Since the patient could not see what was happening on the back, they were convinced that the needle had been inserted into the skin. The patient was advised to concentrate on the 'typical acupuncture sensation' on the back which was described as a feeling of pressure and warmth. Five minutes later the same point on the patient's back was stimulated again with the pencil-like probe and the patient was then told that the needle had been removed. The stimulation was so slight that it did not resemble acupressure treatment.

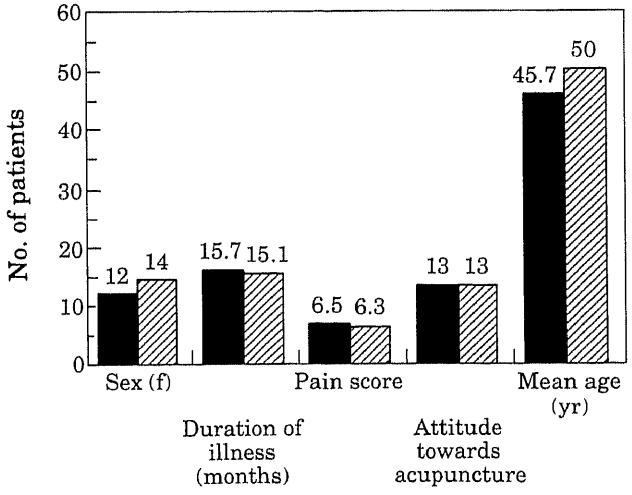

FIG. 1.—The verum and placebo groups were comparable as far as important parameters such as age, sex, duration of illness, intensity of pain and attitude towards acupuncture were concerned. ■, Verum, n = 24; ▨, placebo, n = 24.

Assessment after treatment

After treatment, all patients, with the help of an independent examiner, who did not know whether the patient had been treated with verum or placebo acupuncture, again evaluated their personal pain level by physical assessment of the elbow with respect to pressure, load, or movements of the forearm which were causing elbow pain. The degree of pain relief was again recorded on a 11-point box scale. This time, 0 corresponded to 'no pain *relief* at all', while 10 corresponded to 'complete pain *relief*'.

In addition to this the duration of pain relief ('survival time') was evaluated by following the patients up for 72 h.

RESULTS

After 48 patients had entered the trial, it was stopped on the basis of the results of sequential analysis. All results presented are taken from those 48 patients who completed the trial.

The average duration of the tennis elbow pain was 15.4 months (S = 1.24, minimum = 2 months, maximum = 12 yr). Of the 48 patients, 26 expressed a positive opinion and 21 a neutral opinion concerning the expected outcome of the acupuncture therapy; one patient judged himself as being sceptical of acupuncture treatment. Forty-six patients (91.7%) said they would undergo a course of up to 30 acupuncture treatments, twice a week, if there were any hope of improving or curing their condition. Comparison of the basic data for the placebo and verum groups such as age, sex, duration of illness, intensity of pain, and attitude towards acupuncture are given in Fig. 1.

In the verum group, most patients reported pain relief of 70%; one person felt pain relief of 100%. Mean pain relief in the verum group was 55.8% (S = 2.95) and in the placebo group it was 15% (S = 2.77).

After treatment in the verum group 19 out of 24 patients (79, 2%) reported pain relief of at least 50%, thus meeting the criterion of success (placebo group: six patients out of 24). The results are statistically significant ($P<0.01$, χ^2 test) (Fig. 2).

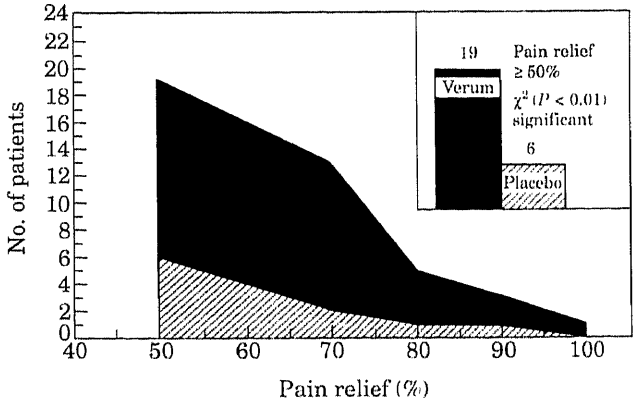

FIG. 2.—The cumulative rate of pain relief. According to the trial schedule, a rate of at least 50% pain relief was defined as being successful. Nineteen out of 24 patients in the verum group and six out of 24 patients in the placebo group met this criterion. Using the χ^2 test, the results were significant ($P<0.01$). ■, Verum; ▨, placebo.

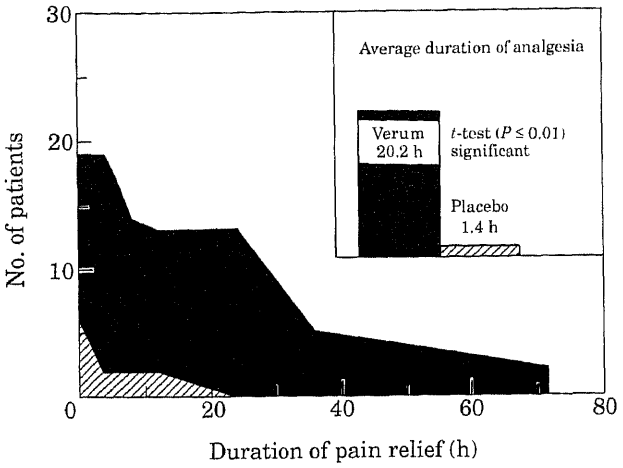

FIG. 3.—The cumulative rate of survival time. The average duration of pain relief in the verum group was 20.2 h (S = 21.54) as opposed to 1.4 h (S = 3.50) in the placebo group. Using the t-test the results were significant (P<0.01). ■, Verum, ▨, placebo.

The average duration of pain relief in the verum group was 20.2 h (S = 21.54) as opposed to 1.4 h (S = 3.50) in the placebo group. The t-test proves the results to be significant (P<0.01) (Fig. 3). Immediate pain relief was 10% higher for patients with a positive attitude towards acupuncture (no significant difference).

DISCUSSION

All reviews on clinical acupuncture trials agree that reliable studies have been rare and produced contradictory results [16, 19, 28, 33]. The basic aim of the present study was to find out whether acupuncture shows an intrinsic analgesic effect after only one treatment which clinically exceeds that of placebo treatment for tennis elbow pain. When interpreting the results obtained in the trial, the following aspects must be taken into consideration.

1. Any puncturing of the skin increases the β-endorphin level of the cerebro spinal fluid, causing mild analgesia [7]. Therefore, to determine the suggestive factor of acupuncture alone, it is necessary to apply a therapy that uses suggestive means exclusively, otherwise the endorphin effect of any needling would increase the therapeutic results of the placebo group unduly [15, 27, 32].
2. Since patients entered the trial voluntarily, the sample was self-selected. Nevertheless the sample for the trial can be considered representative because characteristic sample parameters of the trial match the parameters of the condition 'tennis elbow', which have been published in other clinical studies [3, 14].
3. Since pain is exclusively a personal subjective experience, there are many pitfalls in measuring pain before and after a specific treatment; this holds true especially if a sufficiently long time elapses between two measurements that the patient is unable to remember reliably the pain intensity before treatment and thus cannot compare it exactly with the intensity of pain after treatment. Taking this problem into consideration, the study was designed so that pain assessment took place directly before and directly after treatment, treatment itself lasting not longer than 5 min. Pain in chronic tennis elbow is constant and well known by the patient. Therefore independent change of the pain score should not be assumed.
4. In addition to the duration of pain relief after treatment, the survival time, was recorded. As already assumed by Lewith and Machin, this pain recording method turned out to be more sensitive than merely recording the amount of momentary pain relief [16].

This study has indicated an immediate analgesic effect using acupuncture for tennis elbow pain. Further studies should be carried out to evaluate the long-term therapeutic value of acupuncture for chronic tennis elbow.

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