

## CHRONIC NECK PAIN: A COMPARISON OF ACUPUNCTURE TREATMENT AND PHYSIOTHERAPY

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### SUMMARY

*Objective.* To evaluate the effectiveness of acupuncture, as compared with physiotherapy, in the management of chronic neck pain.

*Design.* Seventy adult patients with non-inflammatory neck pain of >6 weeks duration and with no abnormal neurology were randomly assigned to receive either of the treatments. Thirty-five patients were included in each group.

*Outcome measures.* Pain by visual analogue scale and neck pain questionnaire, improvement in range of movement of neck relative to baseline, and well-being (general health questionnaire). Measurements were recorded at the start of treatment, at 6 weeks and at 6 months.

*Results.* Both treatment groups improved in all criteria. Acupuncture was slightly more effective in patients who had higher baseline pain scores.

*Conclusions.* Both acupuncture and physiotherapy are effective forms of treatment. Since an untreated control group was not part of the study design, the magnitude of this improvement cannot be quantified.

KEY WORDS: Neck pain, Acupuncture, Physiotherapy, Chronic pain.

NECK pain is common. Thirty per cent of the working population aged 25–29 yr and 50% over 45 yr report one or more attacks of stiff neck [1]. Neck pain exists in all occupational groups. In some industries, neck-related disorders may account for as many days of absenteeism as low back pain [2]. Neck pain has significant morbidity, such that it comprises a significant number of referrals to the rheumatologist [3].

Symptoms are most prominent, whilst signs may be limited to neck tenderness or a reduced range of neck movement. Objective neurological abnormality is rare.

Therapy is aimed at relief of pain and stiffness. Many treatments are accepted as standard forms of practice. These include non-steroidal anti-inflammatory drugs and physical measures such as heat, ultrasound and manipulation. There is, however, little good evidence for their accepted use. Education is important.

A physician's survey about attitudes to treatment [4] showed that active exercise, traction, transcutaneous electrical nerve stimulation and ultrasound were perceived to be the best methods for the treatment of neck pain. However, a meta-analysis of studies of conservative management of mechanical neck pain shows no evidence for many of the standard approaches to neck pain used in health care today [5]. Even for the treatments found to have some early evidence of support, such as manual treatments in combination with other treatments, conclusions must be cautious because of the small number of trials on which they are based, and the varying quality of study design.

A number of complementary medical practices, such

as chiropractic, osteopathy, acupuncture and aromatherapy, have been cited as potentially useful.

This study sets out to evaluate the role of acupuncture and physiotherapy in the management of chronic neck pain by randomly allocating matched patient groups to these two modalities of treatment.

### METHODS

#### Subjects

All patients aged 18–75 yr, who were referred over a 1 yr period by general practitioners, orthopaedic surgeons and rheumatologists with neck pain of >6 weeks duration, were suitable for the study. The type of neck pain included postural neck pain, chronic whiplash injury with no instability on cervical spine X-ray, occupationally related neck pain such as in VDU operators, and neck pain related to cervical spondylosis. Patients who had had previous acupuncture or physiotherapy for neck pain were excluded. Other exclusions included patients with neurological signs present due to nerve entrapment, anti-coagulated patients, primary fibromyalgia syndrome, inflammatory neck pain, e.g. ankylosing spondylitis, rheumatoid arthritis, and patients currently receiving osteopathy or chiropractic.

Seventy patients were recruited. The referring doctor was sent a letter explaining the study. The consent of the general practitioner as well as the patient's fully informed consent were obtained. Randomization occurred centrally and the patient had to agree to the study prior to the randomization. Thirty-five patients were randomly assigned to physiotherapy treatment and 35 patients to acupuncture. The equal patient numbers in each group occurred by chance.

#### Study design

The patients had three assessments. These were performed within 1 week prior to the start of treatment,

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after the sixth treatment and at the 6 month follow-up. Each assessment was performed without knowing the results of the previous assessment. These included a visual analogue scale of pain (VAS), the Northwick Park neck pain questionnaire (NPQ) [6] and a composite functional assessment of joint range (neck range of movement). The latter was assessed by having the patient sit on a chair (standardized positioning) with hips, knees and ankles at right angles, and arms folded across the chest to minimize thoracic movement. The back was comfortably supported against the back rest. Using a Myrin goniometer, the patients were asked to perform flexion, extension, side flexion and rotation of the head to both left and right. Each movement was performed three times and a maximum joint range recorded. These were then scored and averaged. A General Health Questionnaire (GHQ 28) was completed on all patients at the three assessments [7].

The physiotherapy was performed by a senior physiotherapist (AAA). An explanation of the therapy was given. Standard localized mobilization techniques were employed, most commonly Maitland rotation, postero-anterior oscillatory movement and longitudinal traction. All patients were given a maximum of six sessions at weekly intervals.

The acupuncture was performed by CR and SM. Both are general practitioners and registered with the British Medical Acupuncture Society. An explanation of the acupuncture technique was given. Sterile, disposable,  $0.25 \times 2.5$  Acumedic needles were used. The patient had local needling of trigger points. In addition, regional needling (GB21—supraspinatus tendon area) and distal needling (L14—web space between thumb and first finger) were used. The needles were left *in situ* for 15 min and manually manipulated once at 7 min. Electro-acupuncture and moxibustion were not used. Each patient had six acupuncture treatments at weekly intervals. No side-effects from the acupuncture treatment occurred.

### Statistics

The VAS score and NPQ score were percentages, but treated as continuous variables. An analysis of covariance (ANCOVA) was performed on each of these responses at 6 weeks and 6 months, taking into account the baseline score and other covariates such as age and sex.

The ANCOVA assumes that the response of interest is normally distributed. This is not the case with the variables considered in this study, as they are scores and therefore all whole numbers. As the range of data was large, it was felt that this was not too great a problem.

There was concern that the variability in the scores was not constant and the analysis was therefore also performed using a variance-stabilizing transformation. The results were, however, similar.

The change in GHQ score from baseline and the joint range scores at 6 weeks and 6 months were analysed using the non-parametric Wilcoxon rank test.

## RESULTS

Of the 35 patients assigned to the physiotherapy treatment, seven did not attend at all, compared to only two patients assigned to acupuncture. Sixty-one patients had baseline measurements taken and began the treatment. Three patients on acupuncture and two on physiotherapy failed to attend the 6 week assessment. A further one acupuncture patient and four physiotherapy patients were absent at the 6 month assessment.

### Baseline characteristics

There were 23 females and 10 males assigned to acupuncture, and 18 females and 10 males assigned to physiotherapy. A  $\chi^2$  test indicated no imbalance. The mean age of the acupuncture group was 48 yr compared to 44 yr in the physiotherapy group. Both groups had a similar age range. *T*-tests and a non-parametric Wilcoxon score test indicated no significant imbalance. The baseline measurements of the various response measurements were checked in the same way and no imbalance was detected. These analyses were repeated using only those patients with complete data.

The baseline characteristics of the non-attenders were no different from those of the attenders. Those who did not attend after the first session were not faring better or worse than the other patients. It is, therefore, reasonable to assume that the response to the treatment in itself does not affect attendance.

### Statistics

Overall, the majority of patients improved over the first 6 weeks on both treatments, as seen in Figs 1–3 and Table I.

### VAS of pain

Figure 1 shows the mean VAS scores for patients in each treatment group with approximate 95% confidence intervals. The means are very similar at baseline, are lower at the first assessment and rise slightly at the end. When the ANCOVA was performed on the trans-

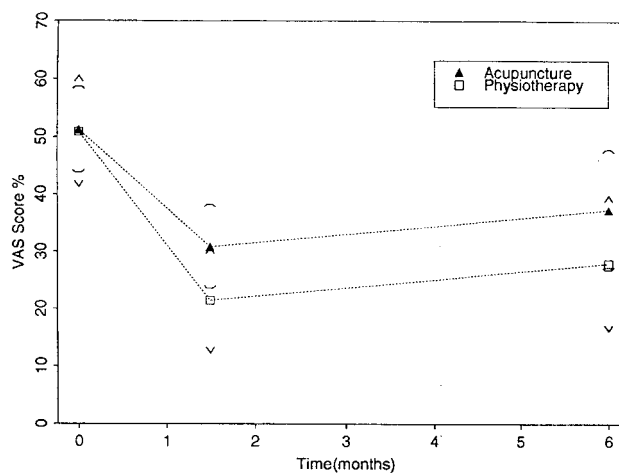


FIG. 1.—Mean VAS scores with approximate 95% confidence intervals.

formed scores at 6 weeks, age appeared to have a significant effect and was retained in the model ( $P = 0.06$ ). The baseline VAS score, as expected, was a major influence on the score at 6 weeks ( $P < 0.01$ ). The choice of treatment was not significant ( $P = 0.18$ ). Although physiotherapy had lower VAS scores at 6 weeks, the difference between the treatments was not significant.

After 6 months, 22 of the 29 acupuncture patients remaining still had lower scores than at baseline. Fifteen out of the 22 physiotherapy patients remaining had lower scores and the rest had higher scores. The ANCOVA showed no significant effects.

#### Neck Pain Questionnaire

Figure 2 shows the mean NPQ scores at each assessment for the two treatments. The mean for both treatment groups falls at the 6 week assessment and then remains fairly constant at the 6 month assessment. The majority of patients improve on both treatments (Table I). At 6 weeks, age, sex and baseline score were found to be important. Treatment was not significant ( $P = 0.72$ ). There was a significant treatment by baseline interaction, however. This suggests that individuals with low baseline scores may do better on physiotherapy and those with higher scores may do better on

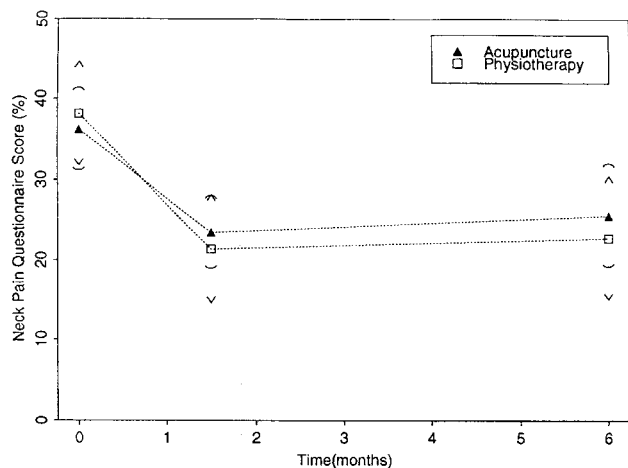


FIG. 2.—Mean Neck Pain Questionnaire scores with approximate 95% confidence intervals.

acupuncture. As there were only a small number of patients in each treatment group, the importance of this result is difficult to assess. At the 6 month assessment, there were no significant effects.

#### Neck range of movement score

The Wilcoxon test showed a marginally significant difference between the treatments at 6 weeks ( $P = 0.09$ ) with physiotherapy appearing to be slightly more effective. At 6 months, there was no difference between the treatments.

#### General Health Questionnaire

Both acupuncture and physiotherapy patients improved their total GHQ score (Fig. 3). An ANCOVA was performed, but here the residuals looked less normal, because the scores are only out of 28, not 100. There were no significant effects. A non-parametric Wilcoxon rank test was performed. The effect of baseline measurements was allowed for here by looking at the change from baseline at each assessment. Neither test was significant ( $P = 0.50$  and  $0.71$ , respectively).

The GHQ 28 is subdivided into four sections: A, B, C and D. Seven questions are asked in each section and the patient rates these as more than usual, the

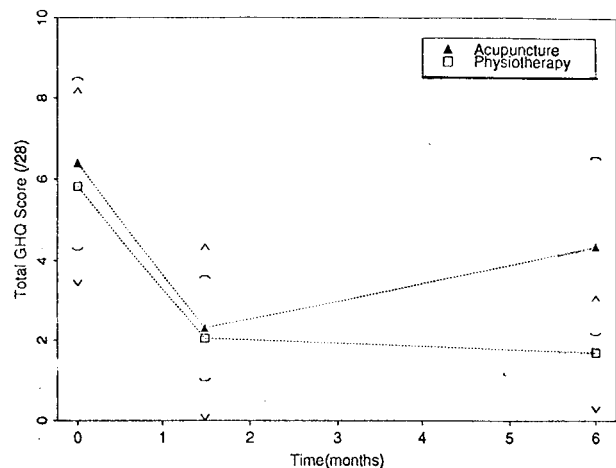


FIG. 3.—Mean General Health Questionnaire scores with approximate 95% confidence intervals.

TABLE I

Number of patients in each treatment group improving, staying the same and becoming worse compared to baseline for the different measurements

Measurement	Treatment	6 weeks			6 months		
		Better	Same	Worse	Better	Same	Worse
VAS score	Acupuncture	25	1	4	23	0	7
	Physiotherapy	23	0	3	15	0	7
NPQ score	Acupuncture	24	1	4	23	2	4
	Physiotherapy	27	0	0	19	0	4
GHQ score	Acupuncture	21	5	4	20	3	6
	Physiotherapy	17	7	1	12	7	3
Joint range score	Acupuncture	10	13	7	11	11	7
	Physiotherapy	12	11	3	7	8	7

same as usual, less than usual or much less than usual. These were then scored as 0, 0, 1 and 1, thus giving a possible total of 28. Section A relates to questions on somatic symptoms, B to anxiety and insomnia, C to social dysfunction and D to depression. Again, the choice of treatment had no effect on the change from baseline of the score within each section at 6 weeks and 6 months.

## DISCUSSION

Despite the understanding of the anatomy and pain-sensitive structures of the neck, pharmacological treatment of chronic pain often fails to achieve optimal control. Further, potential benefits are often diminished by unacceptable side-effects. Physiotherapy is the mainstay of treatment of chronic neck pain. There are, however, very few randomized case-controlled trials to support its efficacy.

Acupuncture is now seen as complementary to orthodox measures of pain relief. Berry *et al.* [8] compared the effects of acupuncture, physiotherapy, injection plus non-steroidal anti-inflammatory drugs and placebo (sugar pill plus sham ultrasound) on pain and joint movement in 60 patients with shoulder cuff lesions. A range of subjective and objective measures were administered before treatment and again at 2 and 4 weeks. All patients improved on all measures and no differences emerged between any of the treatments. In a randomized, controlled study of acupuncture treatment for chronic neck pain, Coan *et al.* [9] compared the progress of 15 patients receiving classical acupuncture with a further 15 receiving no treatment. A total of 80% of the treatment group showed improvement on measures of pain, medication use and activity level. This was better than the untreated group, where only 2% showed slight improvement on any measure. However, all data were obtained from the patients themselves and there were no follow-up data. Further, subjects were recruited through newspaper advertisements and so were self-selected. It is possible that they were not representative of 'rheumatological' type neck pain. Their initial attitude to acupuncture may have been more favourable overall than those of a group presenting at an out-patient clinic. In a comparative study of electro-acupuncture at classical sites vs physiotherapy in the treatment of neck pain, Loy [10] found 67% subjective improvement after 18 thrice-weekly sessions of acupuncture, rising to 87% after 6 weeks of treatment. The comparable figures for physiotherapy were 31 and 53%, respectively. Similar differences were also apparent between the two treatments on objective measures of neck movement. The results appeared to favour electro-acupuncture, although no statistical analysis of the data was presented. No follow-up data were presented either.

Petrie and Langley [11] assigned 13 patients with chronic cervical pain to either classical acupuncture or mock TNS. Treatment consisted of eight twice-weekly sessions of 20 min each and improvement was rated by the subjects on a simple five-point scale. Despite the rather basic rating system, acupuncture proved

significantly more effective than placebo immediately post-treatment. However, the study has no follow-up data. Five of the six patients who had initially received mock TNS were later treated with acupuncture and improved significantly.

In our study, improvement is seen in both the acupuncture and the physiotherapy groups post-treatment, i.e. at 6 weeks. It cannot, however, be concluded that either treatment is in itself effective as this improvement may be due to other factors. However, the improvement was more than one would expect from placebo alone. It was felt unethical to give patients no treatment at all over a 6 month period. The natural history of neck pain of the type included in this study is, therefore, probably not known. Furthermore, although the reasons for careful standardization of treatment in this study are obvious, it should be noted that, in clinical practice, the therapist (physiotherapist or acupuncturist) has freedom to tailor the approach to the individual's needs. In our study, when the two treatment types are compared, there was no significant effect of the treatment. However, owing to the sample sizes and the fairly large variability in responses, equivalence of the two treatment groups cannot be concluded with full certainty. The only significant effects were found for the NPQ score. Acupuncture appeared to work better at reducing neck pain than physiotherapy for patients with high baseline pain scores.

A further drawback of the design of this study, which compares two treatment groups, is the lack of blinding. It is clearly not possible to keep the treatment method secret. However, every attempt was made to make the assessments as independent and as objective as possible. Patel *et al.* [12], in their meta-analysis of randomized, controlled trials of acupuncture in chronic pain, concluded that whilst potential sources of bias, including problems with blindness, precluded a conclusive finding, most results apparently favoured acupuncture.

## CONCLUSION

This study shows that both acupuncture and physiotherapy appear to be similarly effective in the management of neck pain. If the clinician is to choose a single treatment, then perhaps acupuncture might be chosen if the baseline pain score is high. Furthermore, acupuncture treatment within the NHS costs approximately one-fifth that of physiotherapy per treatment.

The growing magnitude and socio-economic factors of neck pain in society demand that more research be conducted into the efficacy and effectiveness of treatment, and indeed into the methodology of trials of physiotherapy and acupuncture. As more studies are accumulated, the influences of a number of factors on the results can be explored. Larger trials or meta-analysis using consistent methodology will be required to determine optimum treatment approaches.

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