TREATMENT OF MIGRAINE HEADACHES USING AURICULAR ACUPUNCTURE TECHNIQUES

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Introduction

Chronic headaches of various etiologies are commonly managed by pharmacological and cognitive behaviour modification techniques. The use of Acupuncture Techniques has been recognized as having both analgesic and prophylactic effects in the treatment of chronic headaches.^{1,2} Acupuncture has also been shown to have prolonged pain relief after treatment is completed.¹⁻³

Individuals suffering chronic headaches also manifest sleep disturbances and reduced levels of activity (withdrawal from social situations).⁴ Chronic headache sufferers are predominantly female^{1,3-5} and this bias is found in all major headache classifications.⁴ Half of these individuals will be 31–50 years of age.⁴

The Ad Hoc Committee on Classification of Headache publication⁶ is the most recognized system of differential diagnosis and classification. Further revisions have been attempted by various authors (references 20, 27, 29 in reference 5). Vascular headaches of migraine type — common, classic and cluster are most common. Muscle contraction headaches (tension), combined muscle contraction and vascular headaches and nasal vasomotor reaction (sinus) headaches are other of the most frequented categories.

This study did not attempt classification of headaches, but relied on previous diagnosis (if any was available). The difficulty is this practice is in the differential diagnosis that often occurs. Wake and Hitchcock⁷ list 16 different names for periodic migrainous neuralgia. Misclassification of individuals may occur. This could effect the treatment regime and prognosis.

Method

As a preliminary survey, subjects for this study were randomly selected, by computer, from the existing clinical database. Subjects ($N = 107$) had all received treatment for headaches of various etiologies.⁸ The clinical protocol is based on auriculo-therapy techniques after Nogier.⁹

This is a technique using a low energy 0.5 mW (or less) Helium Neon laser to stimulate points on the auricle. These points correspond to viscera, cervical spine hormone regulatory systems and cranial nerve nuclei. Treatment consists of one 45-min session every three weeks if necessary.

Between visits, patients have semi-permanent needles injected into these auricular points. This allows continual stimulation of the point. Subjects usually required 3–5 treatment session (over 9–15 weeks) to achieve pain reduction that is significant and prolonged.

Subjects were post-tested only. Ratings of 0–100 (analog scale) were obtained for pain level, levels of sleep disturbance, and activity level. As well, subjects rated level of medication intake, frequency of headaches, age, family, history of headaches, gender and a previous diagnosis (if available). Subjects rated each category at a pre-treatment level and 2 to 4 months post-treatment.

A follow-up survey was done on this subject group at one year post-treatment. The same category parameters were applied. There were $N = 89$ respondents of the original $N = 107$. The remaining 18 subjects could not be reached, chose not to respond or were deceased.

Statistical analysis included paired samples *t*-test (2-tailed). Results were considered significant at $p < 0.05$. Data is reported using frequencies, percentages arithmetic means and modal categories.

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Results

In the 2–4 month post-treatment group ($N = 107$), the mean age was 42.3 years. Subjects ranged in age from 11 years to 74 years.

By age categories, there are 10 subjects (9.4%) less than 21 years of age, 42 subjects (39.2%) from 21 to 40 years of age, 39 subjects (36.4%) from 41 to 60 years and 16 subjects (15.0%) 61 years and over (see Figure 1). There were 28 males (26.2%) with an average age of 47.8 years and 79 females (73.8%) with an average age of 40.4 years. Forty-nine subjects reported a family history of headaches and 58 subjects reported no family history.

A breakdown in etiologies by previous diagnosis shows eight subjects (7.5%) with cluster headache, 44 subjects (41.1%) with migraine headaches (no more specific diagnosis available), 22 subjects (20.6%) with sinus-related headaches and 33 subjects (30.8%) with no previous diagnosis.

Headache frequency reports show 65 subjects (60.8%) with daily occurrence, 25 subjects (23.3%) with weekly occurrence, 17 subjects (15.0%) with monthly occurrence and one subject (0.9%) with annual occurrence (see Figure 2).

Frequency of treatment was categorized as 1 through 5 or more treatments. Of the initial subjects ($N = 107$), 33 (30.8%) report having one treatment session, 23 (21.5%) had two treatment sessions, 14 (13.1%) had three treatment sessions, 14 (13.1%) had four treatment sessions and 23 (21.5%) were treated five or more times. Mean number of treatments were three, modal category was one treatment (see Figure 3).

In the one-year post-treatment group ($N = 89$) the mean age was 42.2 years. There are no significant differences (as determined by t -test) in the descriptive profile of the post-treatment ($N = 107$) group and the one-year post-treatment group ($N = 89$) group. Differences in gender ratio, age categories, etiology breakdown and family history

of headaches are statistically insignificant. For our purposes the one-year post-treatment group ($N = 89$) is a representative sub-population of the post-treatment group ($N = 107$).

Subjects ($N = 107$) reported decreased pain levels from pre-treatment to post-treatment ($t = 18.56$, $df = 212$) significant at $p < 0.01$. Pain levels from pre-treatment to one year post-treatment were decreased ($t = 10.60$, $df = 146$) and significant at $p < 0.01$ (see Figure 4).

Subjects ($N = 105$), reported some level of sleep disturbance before commencing treatment. Sleep disturbances decreased significantly $p < 0.01$ ($t = 25.2$, $df = 208$) from pre-treatment to post-treatment. The reduction in sleep disturbance remained significant at ($p < 0.01$) one year post-treatment ($t = 15.52$, $df = 176$) (see Figure 5).

$N = 83$ subjects reported taking medication for headaches prior to commencing treatment. A significant ($p < 0.01$) decrease in medication intake was reported by subjects at post-treatment assessment ($t = 22.81$, $df = 212$). One-year post-treatment medication intake scores remain significantly ($p < 0.01$) reduced ($t = 13.86$, $df = 176$), (see Figure 6).

Acupuncture is most widely recognized as having the effect of increasing the release of endogenous opioids (endorphins and enkephaline) from the hypothalamic-pituitary tract.^{5, 10} Opioid dysfunction as a causal factor in migraines is supported by various studies (references 4, 6, 16, 17 in reference 5).

Facchinetti *et al.*⁵ have shown migraineurs to have depleted met-enkephalin and beta-endorphin secretion at the hypothalamic level.

Gonadal hormones (LH) display a positive effect on hypothalamic opioid content (references 23, 30 in reference 5). Such an opioid dysfunction would be prevalent at certain times during the menstrual cycle and offer a partial explanation of premenstrual migraine onset in affected females.

Studies^{2, 11} show there is a large placebo effect

Figure 1. Patient distribution by age ranges ($N = 107$)

Figure 2. Study population broken down by headache frequency ($N = 107$)

Figure 3. Patient population broken down by number of treatment sessions ($N = 107$)

Figure 4. Pain levels compared before, immediately after, and 1 year after laser acupuncture therapy. Scoring was from zero (pain free) to 100 (extreme pain). (1 year posttherapy, $N = 89$. Difference in values is statistically significant: $P < 0.01$)

Figure 5. Sleep disturbance patterns shown before, immediately after and 1 year after laser acupuncture. Scoring: zero — no disturbance; 50 — intermittent disturbance; 100 — regular, continuous disturbance. ($N = 105$. Difference in values is statistically significant: $P < 0.01$)

Figure 6. Levels of pain medication before, immediately after and 1 year after laser acupuncture ($N = 83$. Values are statistically different: $P < 0.01$)

(27 = 35%) when using acupuncture to treat headaches. Responses greater than this may be attributed to the therapeutic effects of acupuncture. A range of 50 to 80% pain reduction after acupuncture is commonly reported.³ The longevity of this pain reduction after treatment (months to years)¹ point towards a valid but not clearly understood biophysiological process. Subjects receiving successful acupuncture for headache (i.e. pain reduction) show a simultaneous decrease in consumption of analgesics.²

The use of a Helium-Neon laser in acupuncture has been reviewed¹² and clinical effectiveness may be attributed to variations in power output and time of application to the acupuncture point. Optimum power output is 3 mW and 1 min per point.¹² This is similar to Nogier's clinical protocol followed in this study.

The prevalent vasospastic theory on headache physiopathology views vascular headaches as vasodi-

lating and muscle-contraction headaches (tension) as vasoconstricting in nature. A suggestion in early works was that vasospasticity and pain are causally related.¹³ Later works^{13, 14} have shown that dilation/constriction need not be the cause of pain.

Intra and extracerebral arteries are supplied with a system of nerve fibres containing noradrenalin and another system containing acetylcholine. This perivascular nerve network also contains neuropeptide Y, calcitonin gene-related peptide, neurokinin A and substance P.^{13, 14} These neuropeptides are vasoactive, either as vasoconstrictors or vasodilators.^{13, 14} Several of these peptides have macrophage-stimulating and histamine-liberating abilities. Releasing these peptides would result in neurogenic inflammation.¹⁴ This inflammatory response is characterized by vasodilation, platelet activation and mast cell degranulation.¹³ Vasodilation may not be the cause of the pain, but develops as a result of sensory activation of this perivascular nerve network.

This response sensitizes vessels and prolong the headache pain.¹³ Moskowitz¹³ demonstrated that substance P is released when the trigeminal ganglion is stimulated. Activation of this mechanism would result in a vascular headache.¹⁵ Through this mechanism, emotional influences (moderated by the brain stem) may effect headache outcome.

Moskowitz noted that morphine blocks transmission of signals from the trigeminal nucleus. It is likely that endogenous morphines released via acupuncture have the same effect.

Bovim *et al.*¹⁶ notes an intimate relationship between the trigeminal nucleus and C1/C2 ascending fibres. Nerve blockades at C2 ganglia relieved cervicogenic headache. Excited C2 fibres appear to activate the trigemino-vascular system. Some muscle-contraction (tension) headaches may activate the perivascular nerve network via C2 and the trigeminal nucleus. If so, then headaches are biophysically less differentiated than previously thought. This has been proposed in several psychophysiological studies (reference 53 in reference 8).

Embryology shows the auricle is greatly innervated by C1, C2, trigeminal and vagus nerves. Lasering auricular points may promote the release of endogenous morphines. This would sedate the trigeminal nucleus. We may also directly effect the C1 and C2 fibres and the trigeminal system. Acupuncture can sedate nerve impulses and alter nociceptive transmission. This mechanism would offer immediate (by end of treatment) pain attenuation by sedating the trigemino-vascular system. The release of endogenous morphines would give longer pain attenuation.

Conclusions

He-Ne laser assisted Auriculotherapy Techniques give excellent relief in chronic headache pain. A double-blind study, with differential diagnosis of headache categories would allow evaluation of this technique within individual categories. This study did not consider psychosocial or dietary components of vascular headaches.

It has been postulated¹⁵ that autonomic abnormalities may be peripheral manifestation of a dysfunction located in brain stem centres. If so, then treatment at the causal level should give better and more consistent results. We believe that Nogier's techniques allow treatment at this level.

While our technique offers significant prolonged headache pain attenuation, over time subjects report increased levels of symptoms. We recommend a long-term follow-up be instituted with patients. Those receiving treatment need encouragement to maintain their level of health. For many there is a tendency to slide back into a cycle of chronic headaches and it is not necessary.

Based on the teachings of Paul Nogier (Lyon, France) to balance laterality, an integral group of common auricular points are used. The antidiuretic (ADH) point, which also represents the anterior commissure is located at L17 on the ear map. The projection for posterior commissure, M13 (right ear) on the ear map is also used. If the headache is cervicogenic in nature, the auricular points for C1, C2 and C3 (cervical vertebrae) points are used (H17 on ear grid). This type of pain is associated with whiplash, with no digestive factor involved. If there is a digestive factor involved, the pancreas projection (111 left ear) and gall bladder projection (111 on right ear) are employed. If the pain is located over the dermatome of the trigeminal nerve including temporal, parietal and frontal areas, the projection for the trigeminal (F7 on ear grid) is used on the affected side. If it involves frontal sinuses (i.e. cluster headache) the sphenopalatine ganglion (L13 on ear grid) is used. Please note, although 111 represents the digestive type of headache, this point may also be a projection for the trigeminal nerve and may be utilized for trigeminal pain. In all types of headaches, L18, F14 (cervical 7), and M13 are used for laterality. Balance with H20 on the right ear, (added as a cerebellar point) when neck muscles are involved.

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