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## LETTERS

## Treatment of chronic pain with an auricular acupuncture device (P-Stim) in Singapore

The P-Stim (Biegler GmbH, Mauerbach, Austria) is a portable auricular electroacupuncture stimulation device used for the treatment of pain. Compared to conventional acupuncture, it has the advantage of continuous auricular stimulation for up to 4 days. Its tolerability and efficacy has been demonstrated in studies involving European patients with chronic pain.<sup>1,2</sup> However, no data exists regarding its use in patients living in the tropics, where the weather tends to be hot and humid year-round. These are factors that may affect the wearability of P-Stim, especially if it's to be worn over a prolonged period of time. Here we report the use of P-Stim in a series of subjects with chronic pain in a tropical country like Singapore.

## METHODS

Nine subjects with chronic pain who had P-Stim treatment at the Complementary and Integrative Medicine Clinic of Tan Tock Seng Hospital in Singapore were studied. All subjects received two consecutive P-Stim treatment cycles. Each cycle involved wearing P-Stim for 4 days followed by 3 days without P-Stim. Three auricular acupoints were needled and these depended on the site and cause of pain. The acupoints were continuously stimulated with 2 mA of biphasic constant current at a low frequency of 1 Hz.

The outcome measure was pain intensity over the past week as assessed on a Visual Analogue Scale (VAS) of 0–10, with 0 indicating no pain and 10, severe pain. Pain was evaluated at baseline and at week 1 (after completion of first P-Stim cycle), week 2 (after completion of second cycle of P-Stim) and week 4. Adverse events related to use of P-Stim were documented.

## RESULTS

A total of nine subjects (eight female, one male) were studied. The median age was 51 years and median duration of pain 24 months. The diagnosis of pain was cervical spondylosis (four), lumbar spondylosis (three) and migrainous headaches (two). Acupoints needled included Shenmen, Lumbar Vertebrae, Cervical Vertebrae, Forehead, Occiput, Kidney and Subcortex.

The VAS pain scores over time are shown in figure 1. Only six subjects completed the study. Three subjects withdrew from the study after completing the first P-Stim cycle because their pain was not alleviated by P-Stim treatment. For the remaining six

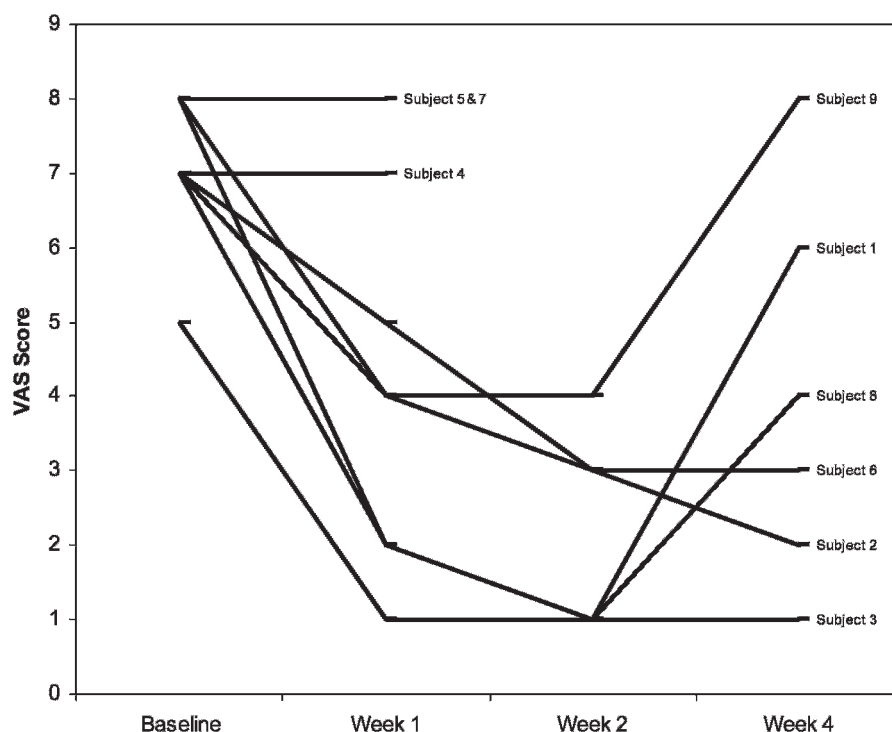


Figure 1 VAS scores over time.

subjects, there was a reduction in VAS scores from baseline to week 4, with the median VAS score decreasing from 7 at baseline, to 4, 2 and 3 at week 1, week 2 and week 4 respectively.

A total of eight adverse events were reported during the study. All were considered mild and were as follows: local pain as a result of stimulation of the device (three), nausea (two), dizziness (one) and local itch (two). Inconveniences with wearing the P-Stim device included difficulty sleeping on the side where the P-Stim was applied (one) and inability to wash one's hair during the period the P-Stim was worn (one).

## DISCUSSION

The results of this small case series suggests that auricular acupuncture with P-Stim generally effective in reducing pain severity in subjects with chronic pain, with four of nine subjects experiencing significant pain relief and better quality of life, and these improvements were maintained at up to 2 weeks after completion of treatment.

The effectiveness of P-Stim in the treatment of chronic cervical and low back pain had been shown by Sator-Katzenschlager *et al* previously.<sup>1,2</sup> In both studies, no adverse events were reported and the device was well tolerated with only four patients finding it unpleasant and declining possible future treatment. In our study, eight adverse

events and two inconveniences were reported respectively. All adverse events were considered mild. The fact that subjects in our study were required to wear P-Stim continuously for 72 hours as opposed to 48 hours in the studies by Sator-Katzenschlager *et al* could have contributed to the greater number of adverse events and inconveniences in our study.

Apart from the small number of subjects studied, the biggest limitation of this study is the short follow up period. In conclusion, this small case series of subjects with a variety of chronic pain conditions in Singapore suggests that auricular acupuncture with P-Stim is generally well tolerated, with four of nine subjects experiencing significant pain relief. Larger studies are probably needed to ascertain its long-term efficacy as compared to conventional body acupuncture.

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## Acupuncture in the treatment of temporomandibular disorders in Sydenham's chorea patient: a case report

A case report for a woman with Sydenham's chorea is presented, and suggests that this treatment may be worth trying in other patients with this condition.

## CASE HISTORY

A 33-year-old woman, a housewife with two daughters, initially presented at the acupuncture clinic with rapid, irregular and aimless involuntary movements of the arms and legs, trunk and facial muscles. The medical history revealed that at age of four the patient developed her first episode of rheumatic fever, without obsessive-compulsive behaviour. However, the patient showed symptoms compatible with Sydenham's chorea such as choreiform movements, hypotonia, motor agitation, loss of coordination, gait disturbances and impediment of speech, associated with joint pain, most prominent in at the temporomandibular joint. The patient has been treated since then with haloperidol. Therefore, during the two pregnancies she presented an exacerbation of her previous symptoms of Sydenham's chorea, which is a very common finding, reporting mainly limitation in the opening of mouth associated with pain and clicks in the temporomandibular joint. It is important to emphasise that she did not stop taking the medication during the pregnancies. Additionally, the pregnancy proceeds normally with any recurrence of the chorea and complications, and her daughters are not affected by any disease.

The conventional treatment for temporomandibular joint pain (occlusal splint) was not able to reduce these symptoms exacerbated during the pregnancies so five years after the second pregnancy the dental department referred her to the acupuncture treatment.

An evaluation of the patient's disease history revealed that she had been experiencing a continuously temporomandibular joint pain for many years and she still presented the involuntary movements of the arms and legs, trunk, and facial muscles since she was 4-years-old. There is no data supporting a connection between chorea and temporomandibular joint dysfunction. Therefore, studies should be done

in order to identify if the facial spasms in Sydenham's chorea can leave to a temporomandibular joint dysfunction.

At the examination, the patient was calm without any signs of anxiety. The patient presented involuntary movements at the temporomandibular joint. On palpation of the area, moderate tension was found in the region of LU19 and TE21. Despite the fact that the patient did not show any obvious signs of apprehension, it was decided to approach both, the muscle-joint component of the temporomandibular disorders and the psychological factor. Acupuncture treatment was started at the first appointment. The patient was seated comfortably and upright in a dental chair. The skin surface was prepared with alcohol swabs. Local points (tender spots in temporomandibular joint) were needled first at the ST6, ST7, LU19, TE21 and VG20 acupuncture points. Disposable filiform needles (0.3 mm×25 mm) were inserted at relevant points until *de qi* sensation (soreness, numbness, distension or heaviness) was achieved, with rotation clockwise and anti-clockwise for 3–5 s and left in situ for 20 min without any stimulation. Various distal points were used in an attempt to improve the effectiveness of the treatment, as is a common practice in traditional Chinese acupuncture. The distal LI4, LR3 and ST36 were used on both sides.

On the following visit a week later, the patient claimed that her symptoms improved. In addition, the involuntary movements in the hands were also reduced and the patient was able to go back to her embroidery. The patient received a similar acupuncture treatment on her second visit, and on the third appointment she claimed to be still improving. In view of her continued improvement, it was decided to provide subsequent treatment in a weekly basis, to a total of 12 sessions. Follow-up appointments at 6 months and 12 months after treatment revealed that the patient was still enjoying her embroidering and had no discomfort in the temporomandibular joint.

## DISCUSSION

Although the classical description of Sydenham's chorea was published as long ago as 1685, the pathogenesis of the disease is still unclear. Neuropathology studies have found neuronal degeneration<sup>4</sup> and vascular changes<sup>5</sup> in the cerebral cortex, basal nuclei and cerebellum. Pharmacological and biochemical alteration, such as dysfunction of the pre-synaptic nigrostriatal dopaminergic system resulting in increased dopamine turnover has been suggested.<sup>6</sup> The predominance of the female gender and the mean age of 11.7 years at the onset of Sydenham's chorea are in accordance with the literature.<sup>3</sup>

In this patient, who had been experiencing pain in the temporomandibular joint for many years without response in several treatment approaches (occlusal splint and

transcutaneous electrical nerve stimulation), the symptoms improved after a single acupuncture session and did not return within one year follow up period. Evidently, a placebo effect cannot be excluded through this case report, thus further studies must be performed to validate our current findings with a larger number of patients and a control group.

Although numerous approaches have been described for this condition, acupuncture is increasingly being used as an alternative to conventional treatment. In this single case report, the relation between time and treatment solution suggests that the acupuncture contributed to its resolution. Expectation may also have played a role. This report is the first known published description of the use of acupuncture in the treatment of temporomandibular disorders in a patient with Sydenham's chorea.

There are several factors in this case that favour causality rather than coincidence. First, spontaneous improvement or resolution in less than 1 year from presentation is rare. The second reason to attribute the improvement to acupuncture is a plausible physiological mechanism. The gate control theories and modern pain physiology try to provide a scientific ground for the actions of acupuncture. Acupuncture acts as a pain-reliever by stimulating the acupuncture points, which affect the A-β nerve fibres. With the constant twirling of the needle, a steady stream of non-pain impulses is transmitted to the substantia gelatinosa causing the gate to close. Once the gate is closed, subsequent pain impulses coming from the slow conducting C fibres cannot pass through. Thus, no pain is felt. The impulses from the A-β fibres can be relayed to the thalamus, which serves as the final gate. Once the gate in the thalamus is closed, analgesia is produced on the entire body. The release of endorphins in the body by acupuncture describes yet another theory. Endorphins are natural painkillers found in the central nervous system.<sup>7</sup>

List and Helkimo (1988)<sup>8</sup> demonstrated that acupuncture points often seem to match with those parts of the masticatory muscles exhibiting tenderness on palpation. The same authors showed that (ST7) corresponds with the location of tender points (latent trigger point) in the masseter muscle of the painful temporomandibular disorders. It was concluded that the acupuncture point should be in the area of presenting discomfort or to a nearby peripheral nerve, anatomically related to the disorder. This approach may also be helpful to elucidate possible unknown aetiological and physiological mechanisms involved. In addition, it has been suggested that as few needles as possible should be used, in order to discern which needle location is most effective in the management of this condition, rather than a multitude of needles of unknown effect.