CASE REPORT

Acupuncture for episodic cluster headache: a trigeminal approach

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SUMMARY

Following evidence that acupuncture is clinically feasible and cost-effective in the treatment of headache, the UK National Institute for Health and Care Excellence recommends acupuncture as prophylactic treatment for migraine and tension headache. There has thus been expectation that other forms of headache should benefit also. Unfortunately, acupuncture has not generally been successful for cluster headache. This may be due to acupuncturists approaching the problem as one of severe migraine. In fact, cluster headache is classed as a trigeminal autonomic cephalgia. In this case report, episodic cluster headache is treated in the same way as has been shown effective for trigeminal neuralgia. Acupuncture is applied to the contralateral side at points appropriate for stimulating branches of the trigeminal nerve. Thus, ST2 is used for the infraorbital nerve, BL2 and Yuyao for the supratrochlear and supraorbital nerves, and Taiyang for the temporal branch of the zygomatic nerve.

BACKGROUND

Although acupuncture is a recommended treatment for migraine and tension headache,¹ it has been regarded as having little benefit in cluster headache. There have been a few positive case reports using a Traditional Chinese Medicine (TCM) approach,²⁻³ but another report showed that although following manual TCM acupuncture there was a significant rise in the low cerebrospinal fluid (CSF) met-enkephalin levels normally seen in cluster headache sufferers, this had little value in preventing the headache.⁴ Cluster headache has been involved in trials that included headaches of all types, and these trials have shown overall success with acupuncture,⁵ but the cluster headache sufferers seem not to have contributed significantly to that success.

The lack of success may well be related to the approach to treatment. Since cluster headache gives the superficial impression of being a particularly intense migraine, acupuncturists have tended to use points and methods traditionally associated with success in migraine treatment. Given that acupuncture is proven to be clinically and cost-effective for migraine,⁶ and is thus considered a suitable prophylactic treatment, this has seemed a reasonable approach.

The Cochrane review of acupuncture for migraine analysed 22 trials, including some positive randomised controlled trials (RCTs) with large sample sizes, and concluded that there is consistent evidence for acupuncture in acute attacks and for

prophylaxis.⁷ These trials used a wide selection of traditional acupuncture points, the more popular being at the back of the head and neck (BL10, GB20,21, GV15), and at distant points on the arm (LI4, TE5, PC6) and leg (BL60, GB40,41,42, LR3, SP6, ST36,44). The reviewers found that although acupuncture generally showed advantage over usual care, there was often little difference between the chosen acupuncture points and those used as sham, suggesting that “exact point location could be of limited importance” in migraine treatment. This is in contrast to the Cochrane findings in a review of 11 trials of acupuncture for tension headache, where sham acupuncture points seemed less effective than myofascial trigger points, and tender traditional points around the head and neck, such as ST8, GB8,14,20,21, BL10, *Yintang* and *Taiyang*, showing that a targeted approach probably is of importance here.⁸

This is suggestive that, as for tension headache, a more structured, localised approach to cluster headache treatment might be more effective than the open, distant point method commonly applied for migraine. Cluster headache is actually classed as a trigeminal autonomic cephalgia, with excruciatingly severe pain, unilateral as is common with migraine, but more specifically within the trigeminal distribution with periorbital or temporal origin.⁹ Trigeminal neuralgia often responds well to acupuncture, indeed, a systematic review of 12 RCTs revealed evidence suggesting that “acupuncture is of similar efficacy as carbamazepine but with fewer adverse effects.”¹⁰ So taking a structured, local acupuncture approach similar to that used in trigeminal neuralgia may offer greater success for cluster headache.

Tian¹¹ made a survey of the points used in trials of acupuncture treatment of trigeminal neuralgia. There seemed to be consensus that pain in each trigeminal division should have an individual local point prescription, although there is such a large number of meridian and extra points on the face and scalp that selection can seem a matter of choice. The commonly used points for ophthalmic division neuralgia are: ST8, GB14, BL2 and *Yuyao*; for the maxillary division: ST2,3, GB3, SI18 and LI20; and for the mandibular: ST6,7, TE17 and CV24. In addition, some used *Taiyang* and the distant points LI4 and LR3 as general points. A problem with neuralgia, and facial neuralgia in particular, is that stimulation, sometimes even of the mildest variety, can precipitate severe pain. So needling into a neuralgic area may well be counterproductive.

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The solution is to avoid the neuralgic area completely, by needling above and below the painful area and contralaterally into the area equivalent to the neuralgic side. The contralateral approach is a standard traditional Chinese acupuncture technique, but is neurophysiologically validated since needling is known to stimulate segmental and central release of endogenous opioids, serotonin and norepinephrine, which will act not only locally, but will have widespread effects via the CSF and bloodstream. A trial comparing treatment for trigeminal neuralgia using facial points on the affected side with those on the healthy side demonstrated success with both, but that treatment on the healthy, contralateral side showed significantly greater benefit.¹² So using this trigeminal approach as a template for the treatment of cluster headache with acupuncture may offer a greater chance of success.

CASE PRESENTATION

A fit, cheerful young man in his 30s, with a diagnosis of episodic cluster headache, was referred 5 years ago for acupuncture. Since the age of 21 years he had suffered two or three major clusters a year, generally in early spring and late autumn, with occasional shorter attacks between clusters. The extremely severe, incapacitating headaches always originated in the right periorbital and temporal region, with pain referred down the front and side of the face to the upper right dental quadrant. Attacks exhibited autonomic signs with a reddened cheek and lacrimation. During a cluster, there were about six attacks a day, lasting 1–2 h each.

He had already been prescribed a variety of medications, which had not proved helpful (some from before the accurate diagnosis), including: indomethacin, propranolol, topiramate, pizotifen and verapamil. He was currently taking lithium and had a supply of sumatriptan for subcutaneous injection and cylinders for high flow oxygen (10 L/min) during attacks.

Although the high flow oxygen was rapidly and dramatically effective in aborting an attack, cylinders were not always readily available, particularly at work, so the triptan, which was effective but took longer to work, was essential. However, as during a cluster there would be several attacks per day, it was easy to use more than the recommended maximum dose of sumatriptan. The patient was very willing to accept the possibility of serious side effects through overdose in order to abort the exquisitely painful headache (a condition that has caused other sufferers even to contemplate suicide),¹³ so he stock-piled triptan during periods of remission against the next cluster. Fortunately, he also had a very sympathetic employer who understood the problems associated with cluster headache and who made appropriate allowance for attacks.

TREATMENT AND OUTCOME

Because the headaches were so severe, during treatment I was cautious lest needling should set off an attack, so for a first, mid-cluster treatment, I used a contralateral approach to the acupuncture, needling with very gentle manual stimulation to *Taiyang* in the left temporal region equivalent to the headache origin and to ST2 on the left maxillary zygomatic process, since pain was referred down the face to the upper teeth. Additionally, since nearly all trials of migraine, tension headache and trigeminal neuralgia used LI4 on the hand and/or LR3 on the foot as standard distant points, I used these as well. When seen a week later, the patient reported that the cluster had ceased and that he had had only three headaches all week, so I repeated acupuncture to the points first used. At 6-week follow-up, he had remained completely clear of attacks and

there was no recurrence for 8 months. Then, after two further treatments, it was clear for a year, after which there was a pattern of attendance for one or two treatments whenever prodromal symptoms and increasing mild attacks threatened to become a cluster. This seemed to abort the cluster within a week with only occasional attacks during remission periods. These usually lasted around 9 months, with a recent 2-year clear stretch. The patient has been off lithium for some years now, managing individual attacks with sumatriptan and oxygen alone.

As attacks really need rapid treatment, I taught him to use self-needling at home (or work) and provided him with acupuncture needles to insert at LI4 and LR3, although not elsewhere since self-needling the face could have been more of a problem.¹⁴ He tried the self-needling a few times, but without noticeable benefit, so we abandoned that technique. Otherwise, I continued to use the original treatment points with the same level of gentle manual stimulation at each session. The patient additionally reported of an interrupted sleep pattern, for which I used GV20 on top of the head. This is traditionally a sedative point aiding sleep and relaxation.¹⁵ He found this beneficial, so I added it to the routine treatment. Also, as an alternative to ST2, I sometimes used BL2 or the extra point *Yuyao* in the left eyebrow, this seemed equally as effective. The needles used were TeWa plastic handled stainless steel 0.2×15 mm with guide tubes.

DISCUSSION

The three divisions of the trigeminal nerve originate from the trigeminal ganglion in the middle cranial fossa. The ophthalmic division passes through the superior orbital fissure as lacrimal, frontal and nasociliary nerves. The lacrimal nerve supplies the conjunctiva, the upper eyelid and the lacrimal gland, which explains the drooping eyelid and weeping eye of the cluster headache attacks. The frontal nerve divides into supraorbital and supratrochlear nerves, which pass through their respective notches (or foramina) in the frontal bone under the eyebrow. The acupuncture point BL2 is over the supratrochlear notch while *Yuyao* is over the supraorbital, so these two points might be expected to have influence in the treatment of pain originating from the ophthalmic trigeminal (figure 1).

The maxillary division passes through the inferior orbital fissure and has several branches, with the zygomatic nerve supplying skin over the temple and cheek so that needling at *Taiyang* over the temporalis muscle should stimulate its temporal branch. The infraorbital nerve passes through the

Figure 1 Anatomical relationship of acupuncture points used in treatment of cluster headache.

infraorbital foramen to supply the side of the nose, upper lip and upper anterior teeth. The point ST2 is directly over the infraorbital foramen in the zygomatic process of the maxilla, so stimulation at this point could well influence maxillary trigeminal pain (figure 1).

It is intriguing that the experiment of self-needling at the traditional distant points LI4 and LR3 proved unsuccessful. This could be because these points are unnecessary for treatment or because success was dependent on interaction with the therapist, but the most likely is that these points enhance the effect of the more important trigeminal points, without which there could have been no response.

The original presentation was typical of episodic cluster headache, but also typical is the variability of attacks and clusters in timing and intensity. Attacks typically become shorter and less severe as the cluster is ending, and after its termination, the period of remission can last anywhere from weeks to years, although remission timing does tend to remain fairly constant.¹³ This makes it very difficult to ascribe beneficial changes to the

acupuncture treatment, with any certainty. However, the unusual reduction in length of clusters and frequency of attacks occurring in direct relationship to acupuncture sessions is suggestive.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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Learning points

- Acupuncture is recommended as a prophylactic treatment for migraine and tension headache.
- Cluster headache is classed as a trigeminal autonomic cephalgia.
- Acupuncture is as effective in trigeminal neuralgia as carbamazepine, but with fewer adverse effects.
- Although the usual acupuncture approach to cluster headache using migraine points is rarely effective, using contralateral acupuncture points associated with trigeminal innervation produces satisfactory benefit.

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