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Cluster headache in an elderly patient treated with neurofunctional acupuncture a case report

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ABSTRACT

Cluster headache (CH) is a trigeminal autonomic cephalalgia and the most painful of the primary headaches. The medical therapy of CH includes both acute therapy for individual attacks and prophylactic therapy to prevent recurrent attacks during the cluster period. Although most patients can be treated effectively, some remain poorly responsive to therapy. The objective of this report is to describe a low cost technique that can be applied in office by a doctor trained in neurofunctional acupuncture and can bring good results for patients with this debilitating disease.

1. Introduction

Cluster headache (CH) is a stereotypical, primary headache disorder that is likely due to an abnormality in the circadian hypothalamic generator with subsequent trigeminovascular activation [1]. CH is classified as a trigeminal autonomic cephalalgia. The clinical presentation is a severe or very severe unilateral orbital, supraorbital and/or temporal pain lasting 15–180 min if untreated [2] (Fig. 1).

Understanding trigeminal autonomic headaches is crucial in the search for treatment and prevention of this disease, which induces considerable nuisance in patients' lives. The diagnosis is critical for effective treatment and allows for prevention since the condition usually responds well to drug therapy, despite its selectivity. Currently, the treatment of cluster headache has been based on empirical etiologic data and there is no clear understanding of the biological mechanism of the disease [1,3]. A placebo response of ~30% exists in drug trials with CH patients, similar to that seen in migraine studies [4].

The medical therapy of CH includes both acute therapy for individual attacks and prophylactic therapy to prevent recurrent attacks during the cluster period. Although most patients can be treated effectively, some remain poorly responsive to therapy [5].

Cluster headache, the most painful of the primary headaches, has been nicknamed the "suicide headache" because victims have contemplated suicide in fear of another cluster attack or have even taken their own lives during an attack [1,5]. This headache syndrome may be under recognized in primary care and thus suboptimally managed due to its low frequency, which can lead to significant morbidity [6,7]. The majority of patients with chronic CH (74%) exhibited severe functional and emotional impairment [8,9].

In the natural history of the disease, a portion of people affected tend to have a decreasing number of pain episodes as they age [7,10]. However, even 15 years after the start of this type of headache, it still usually affects 80% of patients [7].

A Cochrane review suggests that acupuncture is equally or possibly even more effective than prophylactic drug treatment and has fewer adverse effects in migraine prophylaxis and treatment. There is no evidence for an effect of "true" acupuncture over "sham" (placebo) interventions [11]. Another systematic review investigated the use of acupuncture for chronic headache. Needling acupuncture was superior to sham acupuncture and medication therapy in improving headache intensity, frequency and response rate [12].

Thus, benefit of acupuncture in the treatment of migraine headache is clearly stated in the literature. However, there is some present debate between which biological mechanisms differentiate the use of true acupuncture from sham acupuncture with needles in the treatment of this pathology, from the functional point of view. The penetration of the needle through the skin, whether at an acupuncture point or not, has physiological effects. There is no unequivocal evidence that the placebo procedures considered as false or sham acupuncture do not produce significant neurobiological effects. Most studies have shown that even the

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Cluster headache - clinical features (2)
Severe unilateral orbital, supraorbital and/or temporal pain
Ipsilateral conjunctival injection and/or lacrimation
Ipsilateral nasal congestion and/or rhinorrhoea
Ipsilateral eyelid oedema
Ipsilateral forehead and facial sweating
Ipsilateral miosis and/or ptosis
Sense of restlessness or agitation.

Fig. 1. Cluster headache – clinical features [2].

puncture of body areas which do not cartographically correspond to classical acupuncture points trigger neuromodulatory effects, presumably dependent on the population of neuronal receptors predominant in each anatomical location intended to the stimulus. This effect explains the high prevalence of clinical studies that show no difference between true acupuncture and "fake". The neuroscientific understanding of this evidence allows for the development of new clinical studies that, according to recommendations in neurofunctional acupuncture, favour the selection of predominant populations of specific receptors, depending on the functional state of the nervous system. This would allow the obtainment of neuromodulatory effects more suited to diagnosis and clinical treatments that tend to be based on mechanisms of action, instead of direct diagnostics and treatments to simplifying statistical classifications of diseases and injuries [13].

Significantly lower met-enkephalin levels were found in cerebrospinal fluid (CSF) from cluster headache sufferers when compared to age-matched healthy volunteers, whereas it was not possible to demonstrate any clear-cut difference for beta-endorphin. CSF opioid levels may rise following manual or electroacupuncture [14]. These data can corroborate the non-specifically beneficial effects that acupuncture may trigger in the treatment of cluster headache.

2. Evidence of drug treatment

For the treatment of acute cluster headaches, triptans (sumatriptan or zolmitriptan) or oxygen (Grade 1A) has been used. Oxygen should be tried first, since it produces no side effects. When these treatments have no effect there is evidence of the benefit of octreotide, intranasal lidocaine or oral ergotamine. For the prevention of crises that occur with intervals of less than two months, the drug of choice is verapamil (Grade 1B) which shows a dose-dependent benefit, starting with dosages of 240 mg to 320 mg a day (in 3 doses) and reaching up to 960 mg daily. For those individuals with crises persisting at intervals shorter than 2 months there is the recommendation of glucocorticoids (Grade 2C) such as prednisone at 60–100 mg per day, with a gradual reduction to 10 mg/day 5 days after initiation. There are also reports of temporary benefit attributed to the use of glucocorticoids locally injected to block the refractory pain of cluster headache [15].

3. Evidence of treatment with stimulating electrodes

Previous work has shown that unilateral or bilateral stimulation of the occipital nerve may be beneficial [16–19]. In one report, 14 cases of chronic cluster headache which did not respond to medication for an average period of 17.5 months were treated with bilateral stimulation of occipital nerve, with improvement observed in 10 of the 14 treated patients. The electrodes were implanted subcutaneously with local anaesthesia through a bilateral cervical posterior incision, allowing for anchoring of the electrodes in the cervical fascia with the support of an image intensifier. The correct placement was assessed by local paresthesia sensation to electrical stimulus immediately after implantation. Finally, under general anaesthesia, cables connected to a generator located at the subclavian or abdominal region were introduced subcutaneously, and the intensity and frequency of the stimulus was controlled with the patient using a remote control [17].

Deep brain stimulation (DBS) of the posterior inferior hypothalamus is a promising technique in the literature, albeit not yet approved for the treatment of medically non-treatable cluster headache due to the small number of patients studied [17,18]. In a randomized clinical trial that evaluated 11 patients with medically non-treatable cluster headache, the treatment of the posterior hypothalamus with DBS showed no difference between active treatment and the sham treatment during one month in the weekly frequency of attacks [20]. At the end of 10 months, in the uncontrolled phase of the study where all patients received stimulation, a reduction of 50% or more in the frequency of the attacks was observed in 6 of 11 patients studied. Another similar study involving 16 patients with similar clinical profiles DBS showed remission or reduction of attacks in 13 patients after 23 months. The average time improvement was observed took place at day 42 of intervention [21]. In another small study with 4 patients, an improvement of medically non-treatable cluster headache was observed in 2 of the 4 patients after one year [22].

Surgical procedures to destroy the sensory portion of the trigeminal nerve have been proposed, but are not currently approved for this purpose. Occipital nerve and hypothalamic stimulation through deep brain stimulation is a technique in study which seems promising.

4. Evidence of treatment with traditional acupuncture

The understanding of Traditional Chinese Medicine (TCM) in relation to headache is based on the principle that the head is where all the energy channels reside. TCM makes no distinction regarding the physiopathogenic basis of it, but believes that there are multiple factors involved in its onset and that it is related to acute or chronic diseases. When the headache is related to liver yang agitation – within the Chinese knowledge related to situations of great stress or aggressive personality – it should be treated by stimulating the twentieth point related to the meridian of the gallbladder (GB 20). This point is located on the semispinal muscle of head. Thus, despite the fact that clinical features of cluster headache are not directly mentioned in the available literature on TCM, it recognizes the importance of this anatomical region in the treatment of headaches in general, which is possibly due to the stimulation and modulation of the occipital nerve, even indirectly [23].

In Traditional Chinese Medicine concepts of "meridian" and the vital energy "Qi" constitute part of the theoretical basis for puncture at specific acupuncture points. However, there is evidence of clinical research protocols based on a neuroscientific rationale that may show greater effectiveness in clinical outcome [24]. This rationale has been used by the Education and Study Group that operates at the Pain and Acupuncture Clinic of Porto Alegre – GEANF – where the designation "Neurofunctional Acupuncture" represents the epistemological definition of a neuroscientific rationality to design research protocols where the studied neuromodulatory tool is an acupuncture needle, in accordance with Neurofunctional Acupuncture described in this case report.

5. Case report

PL, 65-years-old, male, white, married, salesman, smoker of 1 pack of cigarettes a day for 40 years, physical activity consisting of daily walks of 30 min, with a history of cluster headache diagnosed for 5 years. In the last three months, he appeared with worse headache and monthly recurrences. He has been treated for 5 years with verapamil 80 mg 3 times a day (240 mg/day) for prophylaxis of attacks and with intranasal sumatriptan in