

M. Romoli • G. Allais • G. Airola • C. Benedetto

Ear acupuncture in the control of migraine pain: selecting the right acupoints by the “needle-contact test”

Abstract There is increasing evidence that somatic acupuncture can be helpful in migraine treatment, but substantial data on ear acupuncture (EAP) are still lacking. EAP can be useful both in the diagnosis and in the treatment of many medical conditions. As regards the control of migrainous pain, we present a case report in which a procedure called the “needle-contact test” is described in detail. During a migraine attack, the patient undergoes an accurate search for tender points of the outer ear by means of a specific pressure algometer. Once the most sensitive point has been identified, an acupuncture needle is placed in contact with it for about 10 s, without skin penetration. The expected effect is a quick and evident reduction of acute pain. If no appreciable variation in pain intensity occurs within the following 60 s, a second or third attempt is made on other previously identified tender points, until the point at which the patient notices a clear remission of pain is found. In this positive case, the same testing needle can be immediately used for therapy, completely penetrat-

ing the skin, and then extracted after about 30 min. Alternatively, a temporary needle can be implanted and left *in situ* for a variable period of time (1–15 days). This innovative technique allows the identification, with maximum accuracy, of the most effective ear acupoints on migraine pain during acute attacks.

Key words Acupoint selection • Ear acupuncture • Migraine • Pain

Introduction

There is increasing evidence that acupuncture can be helpful in the treatment of migraine [1]. Whereas a certain number of studies have been conducted on migraine patients using somatic acupuncture, data on the application of ear acupuncture (EAP) in these patients are only anecdotal and there is an urgent need for substantial data.

EAP was discovered towards the end of the 1950s when the French physician, Paul Nogier, observed patients with cauterizations on the outer ear carried out by healers to control sciatic pain [2]. His research spread rapidly all over the world, especially in China, where acupuncturists drew an Auricular Points Chart. The Chinese chart shares several points with the French one, even if they do not perfectly overlap [3]. The concepts of “somatotopic organisation” and “auricular representation” of the different anatomical structures in the human body were consequently transferred into practice as points which the acupuncturist must detect with accuracy and stimulate adequately to get an evident therapeutic answer.

Experimental research on animals has brought evidence of some effects of EAP, such as decreased withdrawal syndrome in morphine-dependent rats [4], activation of the hypothalamic satiety centre in obese rats [5] and inhibition of neurogenic inflammation [6]. Research on man demon-

M. Romoli
F.I.S.A. - Italian Federation of Acupuncture Societies
Prato, Italy

G. Allais (✉) • G. Airola • C. Benedetto
Woman's Headache Center
Department of Gynecology and Obstetrics
University of Turin
Via Ventimiglia 3, I-10126 Turin, Italy
e-mail: gb.allais@tiscali.it

strated a significant release of β -endorphin in EAP-treated patients [7] and a variation of pain threshold applying TENS and He-Ne laser to the outer ear [8, 9].

Recent research highlighted the analgesic, anxiolytic and myo-relaxant effect of EAP. Romoli, in a group of patients with contusive pain, demonstrated a significantly greater reduction of pain in the EAP-treated group compared to the placebo group [10]. Alimi et al. showed that the stimulation of the appropriate acupoints was more effective than placebo for reducing cancer pain [11]. The anxiolytic effect obtained with the application of temporary needles was significantly greater, stimulating a set of appropriate points *vs.* a set of sham points [12]. Romoli et al. demonstrated with electromyography in 3 randomised groups of bruxism patients that auricular stimulation was more effective than non-stimulation in reducing the levels of tension of some masticatory and deglutitory muscles. In the first 2 groups the authors compared acupuncture with needle-contact of the same auricular area related with the hypertonicity of the above-mentioned muscles. The two different modalities resulted in a similar myo-relaxant effect, pointing out the therapeutic effect of simple needle contact without penetration [13].

As previously reported, a veritable therapeutic response is not obtained by stimulating the outer ear without previous diagnosis and an accurate search of the exact point to treat. Oleson et al. [14] were the first to introduce the term of “auricular diagnosis” in mapping the different representations of musculoskeletal pain. They used three different methods: the detection of tender points, the measurement of their electrical conductivity and the presence of skin alterations on inspection of the outer ear [14]. The

rationale of the first method is that auricular areas corresponding to a painful district show increased tenderness in comparison with other areas related to non-painful parts of the body. For this purpose special algometers are used, with a 2-mm metal tip probe and a spring-loaded stylus, able to give a maximal pressure varying between 125 and 600 g. The rationale of electrical detection is that acupoints related to a pain problem show a lowered skin resistance compared to the neighbouring ones. The rationale of the third diagnostic method is that a chronic disease can be suspected by the observation of skin alterations of different types in the auricular area representing the affected organ or anatomical district. The acupuncturist generally employs at least one method to gather sufficient information for reaching a diagnosis.

There is a fourth method, the “needle-contact test”, which has been reported above as a therapeutic modality, but which the Authors wish to propose in the following case report as a combined diagnostic/therapeutic method for controlling acute pain. The procedure is the following: once the most sensitive point is identified with the algometer (Fig. 1a), an acupuncture needle is placed on it for about 10 s without skin penetration (Fig. 1b). The expected effect is the reduction of acute pain: if there is no appreciable variation within the following 60 s, a second or third attempt on other identified tender points must be made, until the point at which the patient notices a clear remission of pain is found. In this case the same needle can be used for therapy and withdrawn after about 30 min, or alternatively a temporary needle can be implanted for a variable duration (1–15 days). The aim of this innovative technique is to obtain maximum accuracy for identifying the most

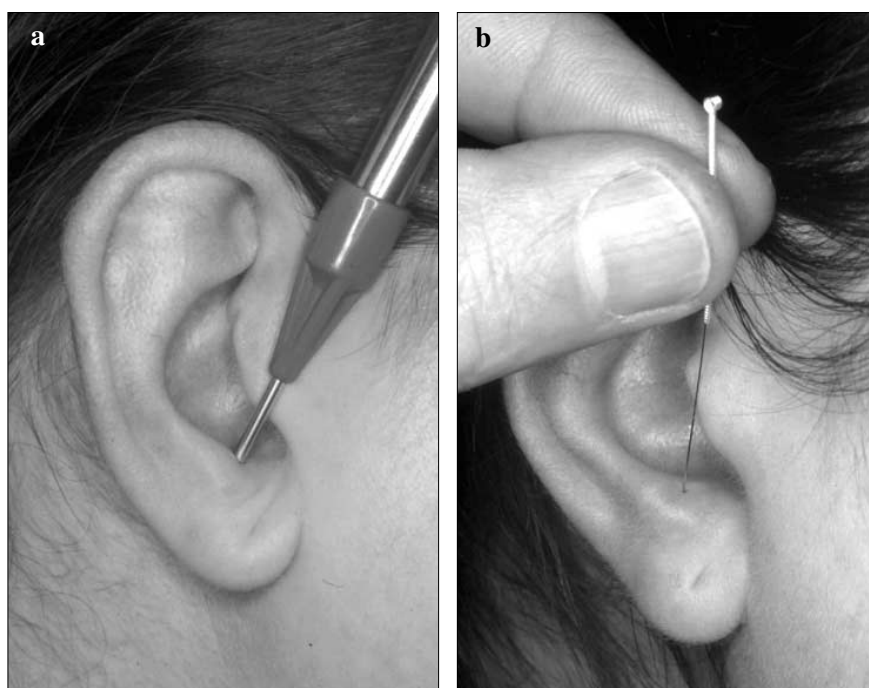


Fig. 1a,b Location of the most tender point detected by the pressure algometer (a) and needle-contact test (b)

effective points. The following case report describes needle-contact application in a patient during an acute attack of migraine without aura.

Case report

A 28-year-old female patient with acute migraine without aura consulted the Women's Headache Center at Turin University. The right-sided throbbing pain had started 3 h before and when she came in for consultation she had not yet taken any medication. She had been suffering for 15 years from migraine without aura, diagnosed fulfilling the International Headache Society's criteria [15]. The attacks, with a frequency of 8–10 times a month, were usually of moderate intensity and accompanied by nausea and phonophobia. Migraine occurred particularly, but not exclusively, during the perimenstrual period. Nimesulide was the analgesic drug she usually took, but it had lost its efficacy over the last few months in coincidence with an increase of migraine intensity, probably due to growing responsibilities at work. The response to triptans was good but the patient feared possible side effects, even though she never really experienced them.

We proposed controlling her pain with EAP and she gave her consent to treatment. Both outer ears were examined with a special pressure algometer able to produce a maximum pressure of 250 g at the tip. The right ear, homolateral to migraine, was clearly more sensitive and a very tender area on the superior and anterior portion of the anti-tragus was identified. The area, after disinfection with

alcohol, was thoroughly explored with the algometer's tip until a very sensitive point was found on which a needle of Chinese manufacture (length 25 mm, diameter 0.25 mm) was lightly applied without skin penetration. At this first attempt a clear reduction in pain was obtained. Immediately after, the needle was pushed down about 2 mm into the cartilage and rotated once in a clockwise/anti-clockwise manner. After this manipulation, the needle was not touched again for the whole period of insertion (30 min). The pain level, measured by means of a Visual Analogue Scale (VAS) on a 10 cm vertical line, was 56 before starting acupuncture. After 10 min the pain dropped to 25 (a reduction of 55.4% after the beginning) and after 30 min it had dropped to 20 (a reduction of 64.3%). Before the patient's dismissal the needle was removed and replaced with a temporary sterile single-use steel implant (Sedatelec, Irigny, France) (Fig. 2a), which the patient was invited to wear until at least the next day (Fig. 2b). These spear-headed implants are 3.4 mm long and have a cylindrical head with 1.2 mm diameter and height. The maximum diameter of the part of the needle that enters the skin is 0.7 mm. Each implant is at the end of a small sterile plastic container that contains compressed air. Locating the end of the container at the acupuncture point and putting pressure on the container releases the implant [11].

The patient had to measure pain intensity again at home 60 min, 120 min and 24 h after the treatment. The patient returned to consultation 2 days later and reported the following VAS values: 18 (60 min), 15 (120 min) and 21 (24 h). She was satisfied with the result and was still wearing the needle, which was well tolerated without any side effects.

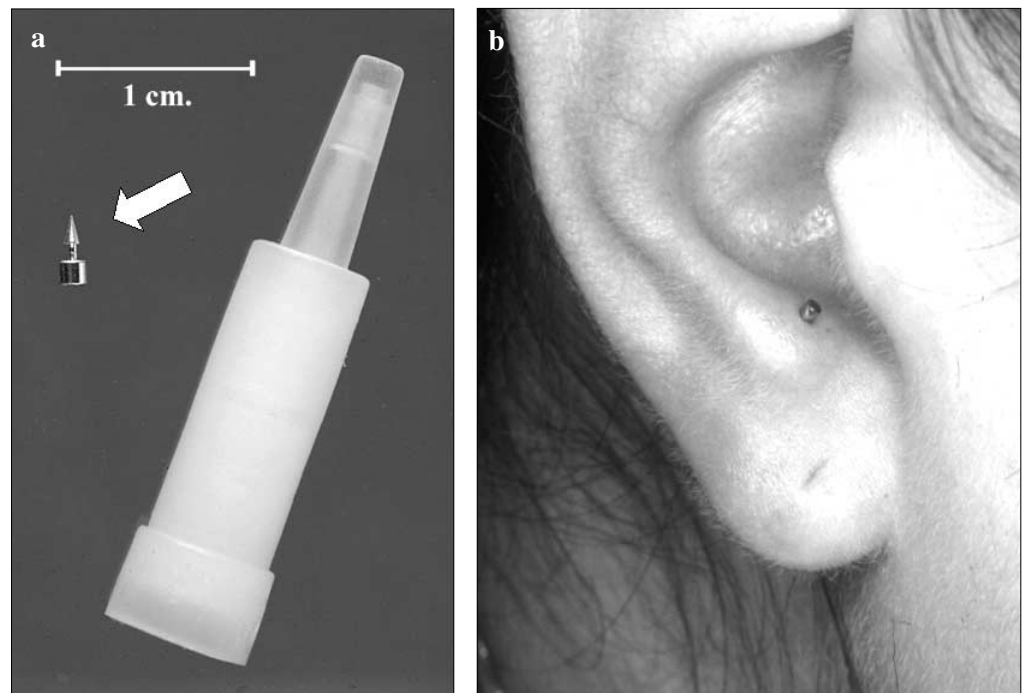


Fig. 2a,b Sterile steel implant with its container (a) and correct insertion of the needle implant (b)

Discussion

From this case report the possibility emerges to treat migraine pain with EAP using a method, the needle-contact test, which at the same time allows diagnosis and stimulation of the most effective point for a given patient. Unlike body acupuncture, which selects points for treatment whose locations have been handed down for centuries and are now consolidated, EAP treats points which have to be detected at every session and may vary from one session to the other in the same therapeutic course.

The efficacy of simple needle-contact highlights the potential of EAP in addressing migraine attacks. It is particularly noteworthy that the technique, when efficient, impacts pain in a very short time (within 60 s from the application of the needle on the point sensitive to pressure) and could therefore be considered a very active non-pharmacological aid in treating acute migraine pain particularly in patients who are inclined to analgesic drug abuse with the consequent risk of developing chronic headache. In any event, the case presented needs to be confirmed in a study with a higher number of patients and compared to placebo stimulation.

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