require the electromagnetic actuator to be Indented. This ability to place the actuator on the bone surface and design of componente único do implante, permite alguma versatilidade cirúrgica, culminando em uma cirurgia mais simples e rápida. O tempo de cirurgia, embora seja curto, tende a surgeons become familiar with the procedure, reaching cases of 30 min of surgical time. Transcutaneous systems generally result in lower rates of complications compared to percutaneous systems, and this was reflected in our safety data. Few complications have been reported and the complications are mostly considered mild. The device provided a statistically significant improvement in the comparison of thresholds with and without the device, including in the high frequency region, between 4000 and 6000 Hz. It is worth commenting that in implantable hearing aids or not, no acoustic gains above 4000 Hz are expected. accompanied by the greater distance between the actuator and the sound processor.

Conclusion: These results confirm the clinical safety, performance and benefit of an innovative active transcutaneous bone conduction implant using a piezoelectric transducer design in individuals with conductive hearing loss, mixed hearing loss, or unilateral sensorineural deafness.

Keywords: Deafness; Implant; Piezoelectric; Hearing aid.

https://doi.org/10.1016/j.bjorl.2022.10.017

Sinaptical transmission in brainstem auditory structures in patients with tinnitus treated with nimodipine: A randomized clinical trial

Rubens Dantas da Silva Junior*, Osmar Clayton Person, Priscila Bogar, Paula Ribeiro Lopes, Fernando Veiga Angélico Junior, Pedro Guedes Pagliusi Garrido, Marina Simões Fávaro, Nathalia Basile Mariotti

Departamento de Otorrinolaringologia, Centro Universitário Faculdade de Medicina do ABC (FMABC), Santo André, SP, Brazil

E-mail address: rubensdantas17@gmail.com (R.D. da Silva Junior)

Objective: To evaluate the synaptic transmission in brainstem auditory structures in patients with chronic subjective tinnitus treated with nimodipine.

Methods: Randomized, triple-blind clinical trial, which selected 40 patients (number close to that suggested by previous sample calculation) allocated equally and randomly in intervention and control group. At first, the brainstem auditory evoked potential (AEP) was performed with a click stimulus of 80 dB for both ears and the tinnitus handicap inventory (THI) and Visual Analog Scale (EVA) questionnaires were applied for intensity and discomfort in each ear. Demographic data were collected with each participant; the characteristics of tinnitus; associated symptoms; factors of improvement or worsening; and personal history. Participants were instructed to take one tablet per day for 30 days of nimodipine at a dose of 30 milligrams or placebo, which were previously manipulated into identical-looking tablets and delivered to participants. After this period, in a second moment, the participants were submitted to a new APE and THI and EVA questionnaires. From the collected data, descriptive and comparative statistical analysis was performed.

Results: The study had the participation of 38 patients, 18 of which were allocated in the control group and 20 in the intervention group, and 2 participants from the control group were excluded from the study due to the discontinuity of the taking of the tablets. The descriptive analysis of the data obtained in the interrogation was similar between the groups, with a predominance of elderly and female participants. Tinnitus was mostly referred to as continuous, ''in cicada'', modulated mainly by noise or stress and usually associated with hypoacusis. Most participants had at least one chronic disease and reported poor sleep quality and exacerbated consumption of xanthenes and sugars in the diet. The comparative analysis of wave latency between the two AEP tests showed a significant difference for wave ncy III and V, with increased values, only in the intervention group. The comparative analysis of the interpeak intervals between the two AEP tests showed a significant difference for the I–III and I–V intervals, with an increase in the values, only in the intervention group. The comparative analysis of the THI and VAS questionnaires showed no significant difference in both groups.

Discussion: The results of this study allow us to assume that nimodipine, a specific calcium channel blocker for the ''Type L'', has action on the central auditory processing pathway, delaying the formation of waves in the topography of the Superior Olivar Complex, where wave III originates; and in the Lateral Lemnisc or Inferior Colliculus, where the V wave originates. These changes would lead to a delay in the afference of the auditory pathway's synaptic transmission and would act in reducing the perception of tinnitus. Previous studies have suggested that nimodipine has neuroprotective action, helping to maintain the integrity of neuronal and peripheral pathways; and otoprotective, preventing injury to ciliary cells and improving blood flow in the cochlea. Studies at higher doses or over a longer period may be an alternative to define whether nimodipine is effective in treating tinnitus. No previous studies were found that tested the use of nimodipine in humans to evaluate tinnitus objectively through the APE; and subjective through THI and EVA.

Conclusion: Nimodipine at a dose of 30 milligrams per day for 30 days in individuals with bilateral chronic subjective tinnitus has evidence to alter the synaptic transmission in brainstem structures. On the other hand, there was no significant improvement in tinnitus complaints reported by patients through the THI and EVA questionnaires.

Keywords: Tinnitus; Nimodipine; Brainstem auditory evoked potential; PEATE; BERA; Tinnitus handicap inventory; THI.

https://doi.org/10.1016/j.bjorl.2022.10.018