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ORIGINAL ARTICLE

Antioxidant therapy in the elderly with tinnitus☆,☆☆

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KEYWORDS
Tinnitus;
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Abstract
Introduction: Several approaches have been tried for the treatment of tinnitus, from cognitive-behavioral therapies and sound enrichment to medication. In this context, antioxidants, widely used in numerous areas of medicine, appear to represent a promising approach for the control of this symptom, which often is poorly controlled.
Objective: To evaluate the effects of antioxidant therapy for tinnitus in a group of elderly patients.
Methods: Prospective, randomized, double-blinded, placebo-controlled clinical trial. The sample consisted of 58 subjects aged 60 years or older, with a complaint of tinnitus associated with sensorineural hearing loss. These individuals completed the Tinnitus Handicap Inventory (THI) questionnaire before and after six months of therapy. The treatment regimens were: *Ginkgo biloba* dry extract (120 mg/day), α-lipoic acid (60 mg/day) + vitamin C (600 mg/day), papaverine hydrochloride (100 mg/day) + vitamin E (400 mg/day), and placebo.
Results: There was no statistically significant difference between THI by degree ($p = 0.441$) and by score ($p = 0.848$) before and after treatment.
Conclusion: There was no benefit from the use of antioxidant agents for tinnitus in this sample.

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PALAVRA-CHAVE
Zumbido;
Antioxidantes;
Idoso

Efeito da terapia com antioxidantes sobre o zumbido em idosos

Resumo
Introdução: Uma série de abordagens terapêuticas tem sido empregada no tratamento do zumbido, desde terapias cognitivo-comportamentais e de enriquecimento sonoro até terapias medicamentosas. Nesse contexto, os agentes antioxidantes, amplamente utilizados em diversas áreas da medicina, parecem representar uma perspectiva promissora para o controle desse sintoma, que muitas vezes tem um controle clínico insatisfatório.
Objetivo: Avaliar os efeitos da terapia com agentes antioxidantes sobre o zumbido em um grupo de pacientes idosos.
Método: Ensaio clínico prospectivo, randomizado, duplo-cego e controlado por placebo.A amostra composta de 58 indivíduos com 60 anos ou mais, com queixa clínica de zumbido associado à perda auditiva, do tipo neurossensorial, em graus variados. Esses indivíduos foram submetidos ao questionário THI (*Tinnitus Handicap Inventory*) antes e após 6 meses de uso da medicação. Os esquemas terapêuticos foram os seguintes: extrato seco de *Ginkgobiloba* (120 mg/dia), ácido α-lipóico (60 mg/dia) + vitamina C (600 mg/dia), cloridrato de papaverina (100 mg/dia) + vitamina E (400 mg/dia) e placebo.
Resultados: O THI após o tratamento foi estatisticamente igual ao THI antes do tratamento, tanto em graus (p = 0,441) quanto em escores (p = 0,848).
Conclusão: Não se verificou benefício estatisticamente significativo com o uso de agentes antioxidantes para o zumbido dos indivíduos avaliados.

Introduction

Tinnitus, whose prevalence is estimated at approximately 10% of the adult population, has repercussions and an impact on quality of life of the affected individuals, that varies from a slight perception without discomfort to an extreme compromise in quality of life.[1]

For those whose tinnitus has significant clinical impact, a number of therapeutic approaches have been described and employed, from cognitive-behavioral therapies and sound enrichment, to drug approaches. Some studies have shown favorable results, while others did not result in benefits.[2] Various substances have been used and tested as drug treatments. Among them, antioxidants have appeared promising.[2] Antioxidants encompass a wide range of substances whose primary function is the neutralization and clearance of free radicals, that is, because of their molecular configuration, result in being toxic and harmful to cells and tissues. With respect to the auditory system, the action of free radicals in cochlear physiology has been demonstrated experimentally.[3–6] In the case of auditory disorders, antioxidants have been used in sudden deafness, to try to prevent ototoxicity, and for acute acoustic trauma,[7,8] as well as in the approach to presbycusis, sometimes with conflicting results.[9,10] In cases of tinnitus, probably the substance most widely used and studied currently is *Ginkgo biloba*, an herbal antioxidant. Associations of antioxidants, vitamins, and phospholipids administered to patients diagnosed with idiopathic tinnitus demonstrated relief of this condition and decreased serum levels of free radicals in a case series study.[11]

Thus, it was decided to test the effects of antioxidants on tinnitus in a group of elderly patients in a controlled clinical study.

Methods

The research project was submitted to the Ethics Committee on Institutional Research and approved under No. CEP 0723/10.

The research was registered with the International Clinical Trials platform of the World Health Organization at: http://apps.who.int/trialsearch/trial.aspx?trialid=ACTRN12610000667011.

The sample was composed of 58 male and female subjects aged 60 years or older with clinical complaints of tinnitus associated with a variable degree of sensorineural hearing loss confirmed by previous audiometric testing. These subjects were administered the Tinnitus Handicap Inventory (THI) questionnaire[12] before and after medication use. THI is a scale that measures discomfort caused by tinnitus, with questions related to everyday annoyances and losses attributed to the symptom, defining a different numeric value for each affirmative or negative answer, or for partial agreement. The final sum (score) is framed by a gradation (degree), from 1 (slight, only perceived in quiet environments) to 5 (catastrophic). In the sample selection, subjects with known allergy to any substance to be tested or with clinical contraindications to the use of these substances were excluded. Anticoagulant users or subjects with coagulopathy, as well as diabetics, were also excluded from the sample.