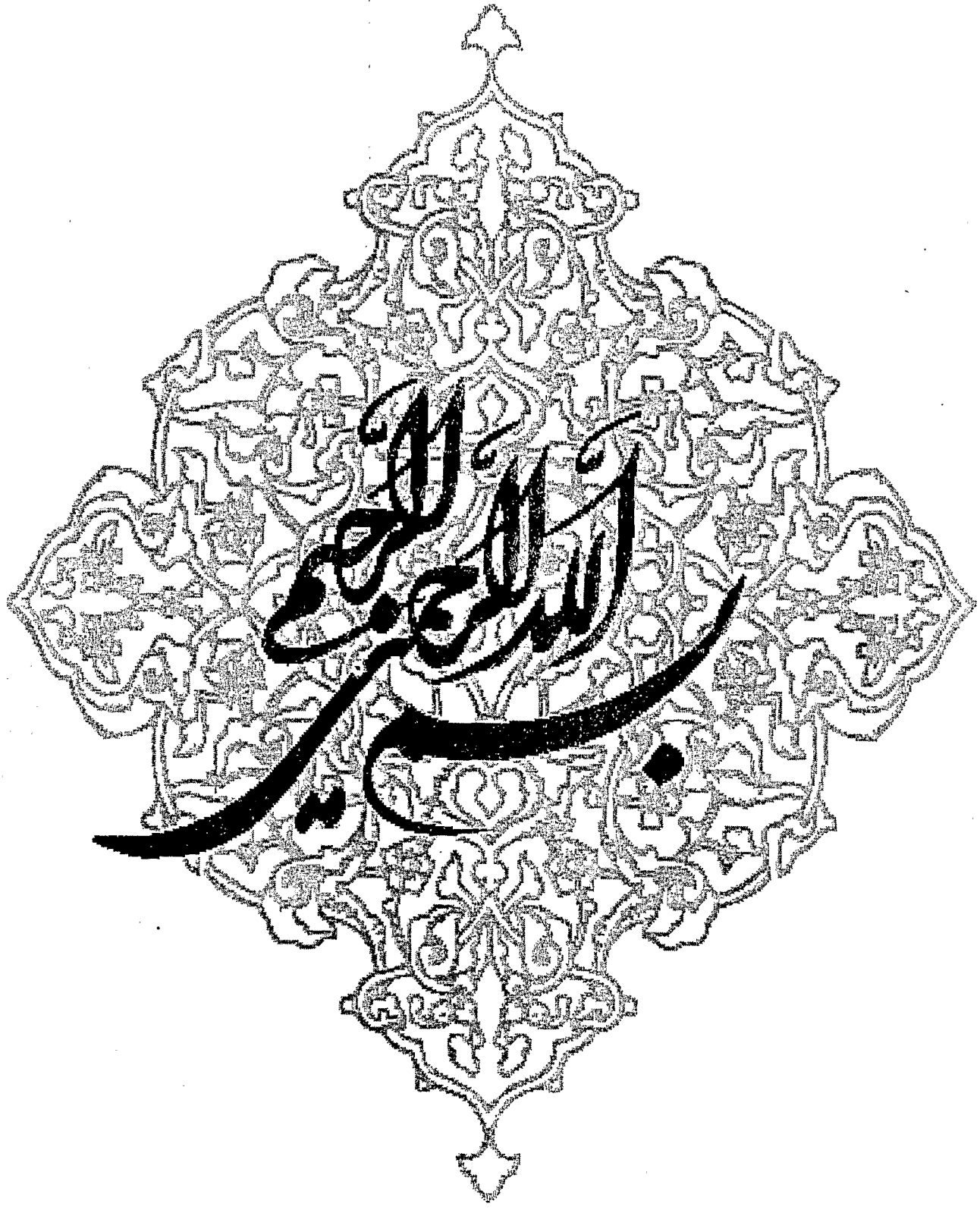

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ISLAMIC AZAD UNIVERSITY

FACULTY OF MEDICINE

THESIS :

FOR DOCTRATE OF MEDICINE

Subject:

The evaluation of Tinnitus Treatment with Trifluoperazine and placebo a Single blind Study

Thesis Adviser :

Dr. F.A.Ehiai

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Abdollah yousefzadeh

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تقدیم به پدر و مادر عزیزم

نگینهای گرانمایه زندگی من

تقدیم به استاد راهنمای عزیزم

جناب آقای دکتر احیایی

تقدیم به برادر عزیزم پدرام

که همواره یار و همراه من

بوده

Abstract

Objective

To test the efficacy of trifluoperazine as a treatment of tinnitus

Design

A prospective, placebo-controlled, single blind study

Patients

50 adult patients who had had tinnitus for a minimum of 1 month and were free of systemic or otolaryngologic disease .25 patients were randomly assigned to the experimental group (group1) and 25 to the control group (group2)

Result

In the experimental group, of patients showed improvement in tinnitus subjective score but in the control group cases showed improvement that there was no significant statistical difference between 2 groups
But in the experimental group after 1 month treatment sleep pattern of cases became improved and in control group after 1 \month treatment sleep pattern in cases were improved that there was a significant statistical difference between these 2 groups

Conclusion

Trifluoperazine was not efficient in treatment of tinnitus in our study but it was efficient in improvement of sleep pattern in patients who their sleep has affected by their tinnitus

Introduction

The inner ear, like the brain, is totally without energy reserves. Its metabolism depends directly on the supply of oxygen and sugar (glucose) from the blood supply. Alterations in glucose metabolism therefore have great potential for disturbing the workings of the inner ear. Between 84 and 92% of tinnitus patients have shown to have a metabolic disorder called hyperinsulinemia.

It is a direct consequence of a metabolic disorder known as Insulin Resistance. This is characterized by a reduced biological response to insulin at the cellular level. Insulin becomes less effective in transferring glucose from the bloodstream to the cells. The pancreas then produces more insulin in order to lower blood glucose levels and insulin levels increase. Hyperinsulinemia is known to be related to hypoglycemia and, as it progresses, leads eventually to Type II Diabetes.

Hyperinsulinemia and Type II Diabetes can most often be controlled through diet and exercise. While tinnitus can be managed with diet and exercise, dizziness is the symptom that diminishes the most with

metabolic control. Therefore we performed current study to evaluate the relationship of tinnitus and diabetes mellitus and whether the prevalence of tinnitus in diabetic patients is differed from its frequency among normal population.

Review of Literatures

Introduction, Philosophy, and Classification

Tinnitus is the perception of sound in the head or the ears. The term tinnitus derives from the Latin word *tinnire,* meaning to ring. Typically, an individual perceives the sound in the absence of outside sounds, and the perception is unrelated to any external source. Sound that only the patient hears is subjective tinnitus, while sound that others can hear as well is called objective tinnitus. Estimates of patients with tinnitus range from 10-15% of the population (30-40 million people). Of patients presenting with ear-related symptoms, 85% report experiencing tinnitus as well. Both adults and children report experiencing tinnitus. Development of tinnitus increases in incidence with age, although the rate of tinnitus in children has been reported as high as 13%.

Many people experience tinnitus after exposure to a gunshot or a loud concert with modern amplification. This type of tinnitus can be annoying, but it usually resolves in a matter of hours. Tinnitus is a symptom (not a disease) and therefore reflects an underlying abnormality. Most typically,

tinnitus is associated with a sensorineural hearing loss, but tinnitus types such as pulsatile tinnitus, tinnitus with vertigo, fluctuating tinnitus, or unilateral tinnitus should be investigated thoroughly.

Philosophy

Most of the knowledge and therapeutic options available to those who experience tinnitus have been encapsulated above. Individuals have placed advertisements in major otolaryngology, audiology, and neurology journals seeking therapeutic help. Such advertisements have yielded a great deal of interest but little of substantive therapy. Unfortunately, because so little is known about the causes of tinnitus, little therapy is available to eliminate the problem. Frequently, therapy that is helpful to one person is not helpful to the next. Thus, many have adopted the philosophical outlook that tinnitus is a chronic or psychologic disease and is managed and not cured. That philosophic approach to the problem of chronic tinnitus is apparent throughout this discussion of tinnitus. Because so few patients are cured, the emphasis should be on helping each individual cope with what is likely to be a chronic problem. As

always, areas of active research are focused on developing a better understanding and therapy oftinnitus, and these are of importance for those interested in academic or investigative pursuits.

Such investigations have recently focused around the quantification of tinnitus, the medical and legal aspects of the problem, and the source of tinnitus. Many of these treatments are pioneered by a dedicated few. Most are described in a journal committed to the investigation, understanding, and treatment of tinnitus.

Classification

Tinnitus is classified in many cases into two categories. It is either objective (ie, audible to anyone in addition to the affected individual) or subjective (ie, audible only to the affected individual). Even though this classification system is used quite frequently, focusing on the etiology of tinnitus is often more useful. The classification is discussed, and then this article focuses primarily on the various etiologies of tinnitus and their respective therapies.

Objective tinnitus is relatively rare. It is sound created somewhere in the body, usually in the ear, head, or neck, and has a muscular or vascular etiology. Muscular tinnitus is observed in several degenerative diseases of the head and neck, including amyotrophic lateral sclerosis. In this entity, the neuromuscular control over the muscles in the ear occasionally deteriorates in an individual with perfect sensory perception. Occasionally, the loss of control results in a repetitive flutter or myoclonus of either the stapedius or tensor tympani muscles. The result is an observable and audible flutter coming from the ear.

Lysis of the tensor or stapedius muscle via a tympanotomy incision is uniformly successful in relieving the symptoms in these cases. However, attention must be paid to the contralateral side. Often, the problem is bilateral, but attention is directed to the louder side. If in fact contralateral problems are present, both muscles should be cut at the same time. This is one of the few cases in otology where operating on both sides at the same time makes sense, decreasing the anesthesia risk and attendant logistic problems for the patient who frequently has problems with mobility.

Palatal myoclonus is a rare cause of muscular-induced clicking tinnitus. It results from rhythmic discharges from the inferior olivary nucleus by a lesion in the triangle of the Guillain-Mollaret (brainstem). The lesion is usually due to stroke, trauma, encephalitis, MS, or degenerative disease. Some success has been reported with botulinum toxin injection therapy.

The other disturbance that is more frequently observed is an aberrance or abnormality of the carotid artery. Aberrances of the carotid artery are documented multiple times in the literature. The carotid artery can also become ectatic as a person ages or as operations are performed on the carotid. The end result is an artery that often takes a tortuous route through the neck and the ear to reach the brain. Such tortuosity produces turbulent flow in the artery, which can be auscultated by the examiner with each heartbeat. Similarly, the jugular bulb and the jugular vein can produce a type of tinnitus that is characterized as a venous hum. Often described by the patient as a vibration or a low-pitched sound rather than as a ringing, these sounds seem to be slightly more frequent than the other two types of objective tinnitus. Many operations have been

described for the treatment of venous hum tinnitus and carotid arterial tinnitus; all of these operations have initially met with success but limited long-termcontrol of the symptom.

Measurement and quantification

Volumes are devoted to the quantification and measurement of tinnitus. One of the more successful and useful mechanisms for the quantification of tinnitus has been the matching of tinnitus to a tone presented to the patient in a sound-treated room, using an audiometer. Such procedures, types of tinnitus matching, are used to provide a measure of tinnitus for reevaluation of symptoms before, during, and after therapy. Although those who experience tinnitus often describe their match as exact, they quickly point out that such a match does not adequately reflect the severity of the problem affecting their daily lives.

Evaluation: History, Physical, and Laboratory

Because of the vast array of potential diagnoses related to tinnitus, each patient requires a thorough history and physical evaluation. Such an evaluation requires attention to detail, including all medical problems and associated treatments and any pharmacologic therapy. The

otolaryngologist is required to expand the evaluation to include the other potential sites of difficulty in this case. Evaluation of tinnitus should begin with a very thorough history, physical examination, and indicated laboratory tests. With tinnitus, direct particular attention to the patient's psychological state. Many patients are depressed or very anxious about the problem. Therefore, the use of various psychological evaluation techniques is required.

History

The goal is to discover the underlying problem that has led to tinnitus. The time course of many cases of tinnitus points toward a labyrinthine source. Details may be obscured by the number of factors that have occurred since the origin of the tinnitus. Further, the detail-oriented individual insists that many issues may have related to the tinnitus. The examiner may be overwhelmed with such details.

Because most cases of tinnitus are related to hearing loss, questions attempt to determine the presence, development, time course, and severity of any hearing loss. The presence of vertigo, otalgia, otorrhea, or

temporomandibular joint disease can relate to tinnitus. Such minor details that would be cursory in other cases may lead to vital answers to the problems associated with tinnitus in these cases.

Many modern prescription and over-the-counter drugs can be a major source of tinnitus, creating or exacerbating the condition. Aspirin or aspirin-containing compounds (in sufficient amounts) often cause tinnitus. Patients vary in their tolerance to the aspirin-containing compounds. Aspirin is often found in small amounts in other drugs as well. In some individuals, 3000 mg of aspirin may produce tinnitus, but this same amount may not affect another person.

Tinnitus is one of the side effects of nonsteroidal anti-inflammatory drugs in nearly every case. However, as with aspirin, this effect seems to be dose related. Diuretics (eg, ethacrynic acid, furosemide) may also produce a dose-related tinnitus. This particular effect may be reversible with these drugs, but it may be permanent in others. Permanent hearing loss and accompanying tinnitus is frequently observed with ototoxic chemotherapeutic agents such as the various platinum compounds. The

American Tinnitus Association (ATA) distributes an extensive list of medications associated with tinnitus. The exact cause of the tinnitus in these pharmacologic etiologies remains obscure.

One of the primary goals of this initial history is to exclude any causes of tinnitus that may be life-threatening. Pulsatile or unilateral tinnitus suggests the possibility of a glomus or cerebellopontine angle tumor. Although many of these are vascular in nature and may be audible by the examiner, most are not and, thus, are audible only to the patient. Fluctuating tinnitus, tinnitus accompanied by dizziness, or dizziness and hearing loss may suggest Ménière disease.

Because tinnitus (in most cases) is associated with depression, seek signs of the condition. A careful assessment of the mental status of patients is an essential part of the initial history. The Minnesota Multiphasic Personality Index can be useful, but it is time consuming and requires professional interpretation. The common associated symptoms of early morning awakening and sleeplessness may be helpful. Other criteria can be used from the current *Diagnostic and Statistical Manual of Mental*

Disorders (*DSM*). A useful adjunct to patient history is the Beck Depression Inventory. A score of 8 or more on the inventory indicates a need for further evaluation.

The Tinnitus Handicap Inventory (THI) is another measure validated and reported in 1996. Use of this instrument is helpful in the quantification of tinnitus and how it affects daily living. The questionnaire can be used at diagnosis and during treatment and follow-up to measure progress. This allows caregivers to better understand how incapacitating the disease process may be and to help in treatment planning.

Physical examination

The physical examination includes not just the ear but also the entire head, neck, and torso for signs of the origin of tinnitus. Include complete auscultation of the neck for bruits, which can be transmitted along the carotid artery, and for venous hums, which can be transmitted along the jugular vein. Auscultation should also be performed around the cranium to check for arteriovenous malformations and Paget disease, which can in rare cases contribute to tinnitus. Be sure to clean the ear canal of wax (a

frequent cause of tinnitus). The examination may reveal other causal indications of tinnitus (eg, red hue of otosclerosis, bluish tint of an uncovered jugular vein). An otomicroscopic examination may assist in this portion of the examination. The eardrum can be examined for fluid or infections, which can contribute to tinnitus.

Other tumors of the middle ear, including glomus tumors, can be observed. The Brown sign, a middle ear bluish-red mass that blanches with positive pressure during pneumatic otoscopy, is a well-mentioned sign of glomus, although not always present. A Toynbee tube (stethoscope with olive tip) or an electronic stethoscope can be used to listen to the ear for objective tinnitus. With glomus tumors, the pulsatile rush of blood in the tumor can be heard. Tuning forks can be used to assess hearing, prior to obtaining audiometric data.

Laboratory studies

Each patient with the symptom of tinnitus deserves complete audiography with pure-tone air, bone, and speech discrimination scores. Order or perform these tests even if (as is common) the patient is unaware of