



# *Tinnitus (Acuphene) in the Nicaraguan adult population*

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Submitted on March 27, 2020 / Accepted on July 10, 2020

<https://doi.org/10.5377/torreon.v9i26.10262>

**Keywords:** adult tinnitus, prevalence of tinnitus; diagnosis of acuphene

## **ABSTRACT**

**T**innitus (tinnitus) is described by the patient as “ringing” or “whistling” “buzzing” inside the ear, which occurs without an external sound source that originates it, its real prevalence is difficult to determine, especially in our environment since the majority of the population that goes to the hospital comes for other otological and audiological causes. The objective of this research was to describe the epidemiological and clinical profile of tinnitus in the Nicaraguan population between 25 and 65 years of age attended in the outpatient clinic by the otorhinolaryngology service at the Antonio Lenín Fonseca Hospital during the period from 1 January and December 31, 2018. For this, an observational, descriptive, cross-sectional study was carried out. 312 clinical records of patients diagnosed with ear pathologies were reviewed, of which 15 had a diagnosis of tinnitus associated or not with other otological pathologies; A systematic probability sampling technique was used. The information was collected using a data collection form, which was validated through a pilot test, for which 35 clinical records were reviewed. Statistical processing of variables: age, sex,

pharmacological treatment, and diagnostic tests were carried out using the IBM-SPSS® version 25.0 for Windows 7 32-bit computer program, using a descriptive analysis, expressed in frequency and percentages. The following results were obtained, 4.8% of the patients with ear pathologies presented tinnitus; the female sex was affected in 3.2%, the age most affected was between 51-59 years, patients with a single diagnosis of tinnitus did not receive any drug, they were diagnosed by otoscopy and audiometry. Persistent tinnitus represented 4.8% of the clinical findings present in the second reevaluation of the patient diagnosed with ear pathologies and 3.8% was related to persistent hearing loss. We conclude that tinnitus prevailed in 4.8% of the population group studied and accounted for 0.4% of diagnoses in the population that comes to consultation for otological involvement.

## INTRODUCTION

Tinnitus is a perception of sound within the ear characterized in different ways by the patient, which occurs without there being an external sound source that originates it.

From the etymological point of view, the word tinnitus comes from the Latin: jingle or chime. The word tinnitus comes from the Greek: a sound that appears. Tinnitus can be divided into subjective or objective depending on whether the buzz is heard by the observer or not and can be differentiated between constant or intermittent tinnitus.

According to the American Tinnitus Association (ATA) cited by Sáez and Herráiz (2006), severe tinnitus represents, after intense pain and balance disorders, the third most disabling symptom that human beings can suffer, Curet and Roitman (2016) express that 85% of otological diseases are accompanied by tinnitus.

Peña (2008), mentions that 15% of the adult population experiences tinnitus, a figure that rises to 25% in those over 60 years of age; Fortunately, this symptom for only 25% would be cause for concern, and for 5% it would be a serious problem, and reason for multiple consultations with the specialist.

Young, Kyung-Do and Kyung-Ho (2015) mention that in the United States and Europe tinnitus affects approximately 12-15% of the general population and more than a third of the population over 65 years of age, without, however, the real prevalence of tinnitus is difficult to determine, especially in our country, where there is an unfortunate lack of standardized statistical data regarding this clinical entity, so the epidemiological data obtained in this study can be used to provide updated estimates of the prevalence of tinnitus.

## **OBJECTIVES**

The purpose of this investigation was to describe the epidemiological and clinical profile of tinnitus in the Nicaraguan population between 25 and 65 years of age, attended in the outpatient clinic by the otorhinolaryngology service at the Antonio Lenín Fonseca Hospital during the period from January 1 as of December 31, 2018.

## **MATERIAL AND METHODS**

The universe consisted of 3,600 clinical records diagnosed with ear pathologies from which 347 records were taken to form part of the sample. A data collection form was used, which was validated through a pilot test in which 35 clinical records were reviewed before the final collection, and the adjustments required to carry out the final collection process were made. It should be noted that these records were not part of the analysis units included in our study, leaving a total of 312. A systematic probability sampling technique was used.

The variables submitted to the study were: age, sex, pharmacological treatment, ear pathologies associated with tinnitus and complications; For the statistical processing of these variables, the IBM-SPSS® (Statistical Package for the Social Sciences) version 25 software was used for Windows 7 32-bit, the Microsoft 365 Office® 2010 software package was used: Microsoft Word® for the debugging of any writing or typing errors, thus facilitating the analysis and reproduction of the results and Microsoft Excel® to edit the graphs and tables (which express in frequency and percentages) the results obtained, to do more comprehensible the information obtained.

## **RESULTS**

Tinnitus (tinnitus) was diagnosed in 4.8% (n = 15) of patients with ear pathologies. As a single diagnosis, it represented 1.9% (n = 6) of the ear pathologies diagnosed in the Nicaraguan population, of which the female sex was affected in 3.2% (n = 10) and the male sex 1.6% (n = 5), the age most affected was between 51 - 59 years old 2.24% (n = 7), followed by 60 - 65 years old 2.24% (n = 7) and thirdly 38 - 43 years old 0.3% (n = 1) .Most of the population came from the urban area 3.2% (n = 10) of these patients, 2 were men and 8 were women. 1.6% (n = 5) came from the rural area, of these patients 3 were men and 2 were women.

In 100% (n = 15) of the patients diagnosed with tinnitus (tinnitus), the incapacity caused by this clinical entity was not evaluated, since the application of the "Tinnitus Handicap Inventory (THI)", although audiometry and otoscopy were performed at 100% (n = 15), no audiometry or speech audiometry was performed, nor prescribed audiometry. There was one patient who

underwent a test of Romberg, in addition to otoscopy, audiometry, and tympanometry, who was suffering from Menière syndrome.

Tinnitus (tinnitus) was exclusively diagnosed in 2% (n = 6) of the patients and 2.88% (n=9) was related to other ear pathologies such as:

*Table1. Ear pathologies related to tinnitus (acuphene)*

<b>Ear pathologies related to tinnitus</b>	<b>Frequency</b>	<b>Percentage</b>
Left ear Showanoma	1	0,33
Menière syndrome	1	0,33
<b>Presbycusis</b>	<b>4</b>	<b>1,28</b>
<b>Chronic otitis media and mixed hearing loss</b>	<b>3</b>	<b>0,9</b>
<b>Total</b>	<b>9</b>	<b>2.88</b>
Note: The percentages were calculated taking into account the sample size (n = 312).		

*Source: Database extracted from clinical records of patients diagnosed with ear pathologies.*

Regarding the pharmacological treatment of these patients, it was found that the patients who had a single diagnosis of tinnitus did not receive any pharmacological therapy, on the contrary, those patients who did have another pathology associated received the following drugs: (see table on next page)

Ear pathologies related to tinnitus	Prescribed drugs										TOTAL	
	None		Dimenhydrinate		Loratadine		Cipro*		Cipro + Dexa**			
	F	%	F	%	F	%	F	%	F	%	F	%
Left ear Showanoma	1	0.33									1	0.33
Menière syndrome			1	0.33							1	0.3
Presbycusis	1	0.33	2	0.6	1	0.33					4	1.28
Chronic otitis media and mixed hearing loss							1	0.33	2	0.6	3	0.9
<b>TOTAL</b>	<b>8</b>	<b>2.6</b>	<b>3</b>	<b>0.9</b>	<b>1</b>	<b>0.33</b>	<b>1</b>	<b>0.33</b>	<b>2</b>	<b>0.6</b>	<b>9</b>	<b>2.88</b>

Note: **F**: Frequency, **%**: Percentage. **Cipro\***: Ciprofloxacin 500mg orally. **Cipro + Dexa \***: Ciprofloxacin 0.3% plus dexamethasone 0.1% optically, The percentages were calculated taking into account the sample size (n = 312).

Source: Database extracted from clinical records of patients diagnosed with ear pathologies.

Persistent tinnitus represented 4.8% (n = 15) of the clinical findings reported in the second reassessment of the patient, showing that of these 15 patients, 6 who presented this pathology exclusively continued to report the same symptoms. 3.8% (n = 12) in addition to tinnitus reported persistent hearing loss.

## DISCUSSION

The prevalence of tinnitus in the population group studied was 4.8%, similar data reported by Peña (2008), who mentions that only 5% of patients who present with tinnitus go to the otorhinolaryngological consultation, which could explain the prevalence associated with a pseudo diagnosis of this pathology in our environment since it was identified that access to the hospital unit was not a determining factor in our study when receiving the diagnosis of tinnitus since 3.2% of the population came from the urban area

In this study it was evidenced that the patients who had an exclusive diagnosis of tinnitus were women, agreeing with Dauman and Bouscau (2004), disagreeing with the findings described by Alf and Anders (1989) who express that tinnitus is more frequent in men than in women, however, the above disagrees with Curet and Roitman (2016) who describe a similar incidence in both sexes.

The age range affected by tinnitus agrees with Quezada (2018), which describes that this clinical entity is more common in people between 40 and 70 years of age, agreeing with the age ranges in which this pathology predominated in our study since we found a higher prevalence in the fifth and sixth decade of life, for which we express that in our environment the causal etiology of tinnitus could be associated with the deterioration of the auditory apparatus located in the inner ear since presbycusis was identified in 1.28%. It was the main diagnosis associated with tinnitus, which agrees with Alf and Anders (1989) who express that tinnitus is more common with hearing loss than with subjectively normal hearing.

It was found that tinnitus was associated with other otological pathologies in 2.8% of cases, agreeing with Curet and Roitman (2016) who express that tinnitus in clinical practice can be associated with 85% of diseases of otological origin, of which can be the etiology of the same, such is the case of chronic otitis media that is associated with the infectious etiology of tinnitus, this theory is explained by the fact that the microorganisms that cause them can migrate towards the inner ear causing associated labyrinthitis deterioration of the epithelium which results in its appearance. Another theory associated with the appearance of tinnitus in this study was neoplastic etiology since a patient with shwanoma was found whose main symptom was tinnitus associated with pulsatile headache, in agreement with what was expressed by Sáez and Herráiz (2006) who mention that tinnitus It may be the main reported symptom of a serious underlying disease, which occurs in 80% of patients during their diagnosis, as evidenced in this research.

The persistence of tinnitus associated with hearing loss after a second reevaluation reflects the little diagnostic and therapeutic intervention of this clinical entity in our environment, which implies an unsatisfactory impact on the quality of life of the patient who comes to the otorhinolaryngological consultation, the association of tinnitus and hearing loss agrees with that expressed by Morales, Quiroz, Matamala & Tapia (2009). Regarding the above, Sáez and Herráiz (2006). They report a prevalence of this association of 86% and also express that the simultaneous presentation of these symptoms will be associated with middle ear pathology (chronic otitis media) or internal ear pathology (presbycusis), as evidenced in our study.

Regarding treatment, it was evident that 2% of patients diagnosed only with tinnitus (tinnitus) did not receive any treatment, whether pharmacological or not, which suggests that in our environment, patients have received the diagnostic and therapeutic sentence expressed as follows: «there is no effective medicine, that does not go away, it has to live with it» by the treating medical personnel and perhaps this attitude is due to the precariousness of the diagnostic resources and the absence of a clinical management guide in our environment, which explains the deficient diagnostic evaluation supported by the fact that this study did not verify the performance or prescription of tinnitus and the Tinnitus Handicap Inventory test. These

two diagnostic tests allow us to assess the psychoacoustic characteristics of tinnitus related to intensity, tone, frequency, as well as the impact on the quality of life.

Wimmer and Cols. (2018), They mention that when tinnitus with hearing loss coexists, there is a deficit in afferent activity from the cochlea, it is expected that a decrease in activity is generated in the rest of the auditory pathway, however, what happens is precisely the contrary, hyperactivity is generated at the level of the subcortical nuclei of the central auditory pathway, which triggers neuronal plasticity at the level of the entire auditory system, contributing to the development of tinnitus.

The fact that no patient was prescribed or performed tinnitus as well as the disability caused by tinnitus using the THI questionnaire, evidences the precarious management of this pathology in our environment. So we propose the implementation of these two audiological evaluations, as well as a clinical diagnosis that clears the primary nature of it, addressing in detail the mode of the establishment (gradual or sudden), a family history of tinnitus reflected in a good clinical history that can allow the correct classification of tinnitus and an adequate etiological approach, fundamental for the subsequent treatment.

## **CONCLUSIONS**

Tinnitus (tinnitus) is a complex clinical entity with a prevalence of 4.8% in the population group studied, which accounted for 0.4% of the total pathologies diagnosed in the population that comes to consultation for otological involvement, prevailed in women over 50 years. Poor diagnostic and therapeutic management was evidenced in our country.

## **RECOMMENDATIONS**

Standardize and normalize the diagnostic and therapeutic procedures of patients with tinnitus by creating a clinical guide to strengthen the quality of care in these patients. It is proposed to record in the clinical record the application of the THI test to all patients with tinnitus (tinnitus) and the Romberg test, as well as to protocolize the performance of tinnitus within diagnostic audiological tests.

## **ETHICAL DISCLOSURES**

### **Protection of people and animals.**

The author states that no human or animal experiments were performed for this study.

### Confidentiality of data

The author declares that the confidentiality of the doctor-patient relationship recorded in the clinical record was respected at all times since at no time during the collection of information and dissemination of the results was the name or any information identifying it recorded.

### Right to privacy and informed consent

The author declares that in this study, the source of information was the clinical file, there was no direct contact with the patient, so his consent was not requested.

### Conflict of interests

The author has no conflicts of interest to declare. Funding source: none.

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