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Etiological Assessment of Tympanic Perforations: Case of the ENT Departement of Sikasso Hospital

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Abstract **Original Research Article**

Tympanic membrane perforation is a loss of substance that creates an abnormal communication between the middle ear and the external auditory canal, it follows a middle ear infection or direct trauma and is usually seen in young people. The aim of this study was to determine the etiologies of tympanic membrane perforations in the ENT department of the hospital in Sikasso. This was a prospective study over a period of 6 months from June to November 2014 in the ENT department of Sikasso hospital, involving all patients seen in consultation for tympanic membrane perforation. We collected 110 cases of tympanic perforations out of a total of 1844 patients received, i.e. a prevalence of 5.15% of cases. The average age of our patients was 25 years with extremes from 09 months to 72 years. The majority of our patients (32.7%) consulted for otorrhea, followed by hearing loss (21%), otalgia (20%), tinnitus with or without vertigo (14.50%) and trauma (11.80%). Infections were incriminated in the majority of cases (70.9%) and traumatic causes in 29.1%. Tympanic substance loss was marginal in 47 cases (including 11 attic cases highly suspicious for cholesteatoma), central (punctiform) in 46 ears and judged total in 17 cases. Unilateral perforations were found in 95 patients and bilateral in 15 cases and predominated in the left ear. Pure tone audiometry was performed in 83 patients, and found transitional hearing loss in 51.8%, perceptual hearing loss in 13.3% and mixed hearing loss in 34.9% of cases. Tympanic membrane perforations are relatively common in our practice, and occur mainly in young subjects. Otological infections and trauma are the main causes. They are accompanied by hearing loss. Iatrogenic causes due to attempts to remove foreign bodies dominated the traumatic causes in our study.

Keywords: Etiology, perforation, tympanic membrane, Sikasso hospital.

INTRODUCTION

Tympanic membrane perforation is defined as a loss of substance that creates an abnormal communication between the middle ear and the external auditory canal (EAC) [1].

The tympanic membrane is composed of two parts of unequal importance: the pars tensa (the larger) and pars flaccida. It is composed of three different layers: a cutaneous epidermal layer, a fibrous middle layer and an inner layer in continuity with the mucosa of the tympanic cavity [1-3].

A normal eardrum transfers vibrations from its entire surface to the base plate of the stapes through a chain of ossicles in the middle ear. The tympanic membrane also protects and acts as a shield to prevent infection from entering the middle ear and maintains a phase difference in sound conduction [3, 4].

Perforation causes a decrease in ossicular coupling due to the inability to transmit pressure across the tympanic membrane (TM) [4].

Tympanic membrane perforations (TMPs) are classified into three groups: central, marginal and total. Central perforations are those that maintain a 360 degree tympanic edge around the perforation. In contrast, it is said to be marginal, if the loss of substance reaches the tympanic sulcus. Total perforations are rare and technically represent an advanced variant of marginal perforations [1].

LMPs are usually due to chronic otitis media often resulting in hearing loss, followed by trauma and recurrent suppurative acute otitis media [4, 5].

Chronic otitis media has been identified in the human skeleton since prehistoric times. It is one of the most common diseases in ENT practice, encountered in children of low socioeconomic status [6].

MATERIAL AND METHOD

This was a prospective and descriptive study over a period of 6 months from June to November 2014 in the ENT department of Sikasso hospital.

The study focused on patients presenting to the ENT department of the Sikasso hospital for an otological condition.

All cases of tympanic perforation received in the department during the study period and who gave their consent were included.

Patients with pathology other than tympanic perforation and those who did not give consent were excluded.

The data was collected from a survey form, entered, analysed in Word 2010 and Epi info version 3.5.3 / 2011 and documented for the study. Graphs were produced in Excel office 2010.

RESULT

Among the 1844 patients seen in the department during the study period, we recorded 110 cases of tympanic perforations in 95 patients, i.e. a prevalence of 5.15%.

The sex ratio was 1.3 in favour of males (56.4% of cases). The average age of our patients was 25 years with extremes from 09 months to 72 years. The age group 15-45 years was the most represented with 37.3% (Figure 1).

Otorrhea was the most frequent reason for consultation with 32.7%, followed by hearing loss 21%, otalgia 20%, tinnitus with or without vertigo 14.50% and trauma with 11.80% (Figure 2).

Infections were incriminated in 70.9% of cases and trauma in 29.1% (Table I). The tympanic substance loss was marginal in 47 cases (including 11 attic cases with strong suspicion of cholesteatoma), central punctiform in 46 ears and judged total in 17 cases (Table II).

These tympanic perforations were unilateral in 95 patients, bilateral in 15 cases and predominantly in the left ear in 9/15 cases (Table III).

Pure tone audiometry was performed in 83 patients; the hearing loss was of type. In 51.8% of cases, the disease is transmissible, in 13.3% of cases it is perceptual and in 34.9% of cases it is mixed (Table IV).

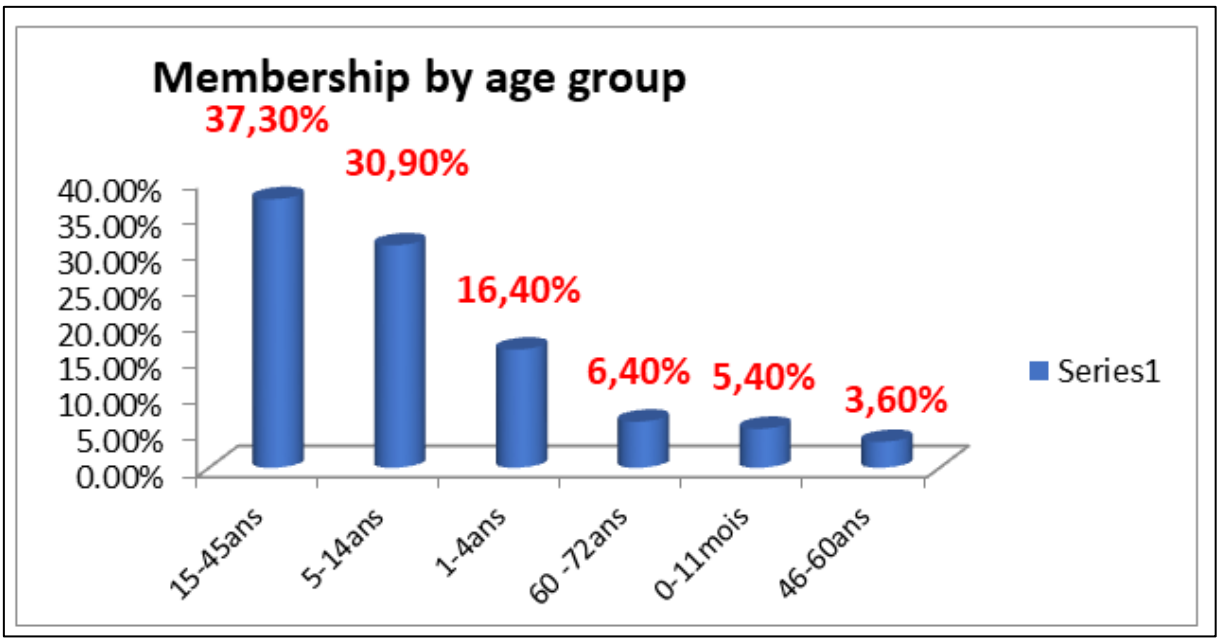

Figure 1: Distribution of patients by age group

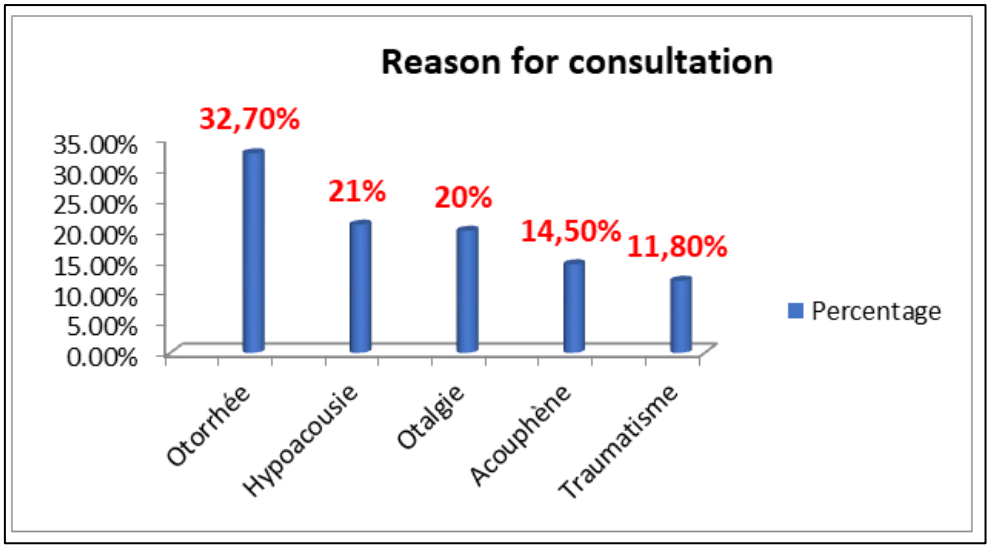

Figure 2: Distribution of patients by reason for consultation

Table I: Distribution of Tympanic Perforations according to the causes

CAUSES		N	%
INFECTIOUS	WTO	51	46,4
	OMA	27	24,5
TRAUMATICS	AVP	O3	2,7
	VD	5	4,5
	V.Conjugal	8	7,2
	Iatrogenic	16	14,5
TOTAL		**110**	**100**

Table II: Representation of patients by type of perforation

Nature of the perforation	**N**	**%**
Central	46	41,8
Marginal	47	42,7
Total	17	15,5
Total	**110**	**100,0**

Table III: Representation of patients according to perforation location

Seat of the perforation	**N**	**%**
Right	39	35,5
Left	56	50,9
Bilateral	15	13,6
TOTAL	**110**	**100,0**

Table IV: Representation of patients according to tone audiometry result

Pure tone audiometry	**N**	**%**
Conductive hearing loss	43	51,8
Sensorineural hearing loss	11	13,3
Mixed hearing loss	29	34,9
TOTAL	**83**	**100,0**

CMO: Chronic Otitis Media,
AOM: Acute Otitis Media,
AVP: Accident on the public highway,
VD: Domestic violence,
VG: Domestic violence.

DISCUSSION

The limitations of this work were mainly the lack of support from diagnostic services (biology and imaging), the absence of a microscope, but also the suspected cases of cholesteatoma referred on the basis of clinical presumptions.

The incidence of tympanic membrane perforation in our study was 5.15%. In the literature it varies from 2.1% in the USA to 24.15% in Nepal with 7.8% in Nigeria [5, 8, 9]. The male sex was the most represented with 56.4% of cases. This male predominance is widely reported in the literature [1, 3, 10].

In our practice, as well as in the series, it is seen at all ages and particularly in the young. This implies that even the young population is at risk of losing hearing function due to perforations [7, 11, 12].

Our patients consulted for the same reasons as those mentioned by some authors, mainly otorrhea, followed by hypoacusis, otalgia, tinnitus with or without vertigo and trauma. This could be due to the social inconvenience of the symptoms but especially to the recurrence of otorrhoea [12-15].

According to the WHO 150 million people worldwide suffer from tympanic membrane perforation [2].

Tympanic membrane perforation is one of the causes of hearing loss. The resulting hearing loss is one of the most common sensory impairments in the world and is highly detrimental to the general well-being of patients [5, 7].

Thus, infectious otitis media was the main cause of tympanic membrane perforation with 70.9%, followed by trauma 28.9% of cases. Foma winga *et al*., in Lomé in a similar study reported 75.2% infectious causes and 20.9% traumatic causes [3]. The same observation was made by Fatogoma. I. K in Bamako, Mali [12].

However, for Evaristus E *et al*., traumatic causes due to aggression (domestic and marital violence) were the most numerous 58.1% [11].

Our cases of traumatic perforations were more iatrogenic, especially in the under 5s. We put this in the context of under-medicalisation, as many of these patients came from primary care without qualified personnel after attempts to extract foreign bodies from the ear.

We did not encounter any blast or incandescent perforation in this work. For tympanic substance loss, our results are similar to those of Fabio [1]. However, in the literature there is no consensus on the classification of tympanic substance loss [2, 12, 16].

Tympanic perforation, regardless of cause, results in hearing loss [3]. Our young patients were the most affected, the same observation is found in the series [4, 7]. This implies that the young population is also at risk of hearing loss, which is detrimental to their well-being, thus affecting their health [11].

All authors agree on the fact that tympanic perforations are mostly unilateral, which is also a finding in our practice without having an explanation [6, 9, 12, 14].

All our patients had hearing loss, 51.8% of them were transitional, 13.3% perceptual and 34.9% mixed. According to A. K. Rana and coIl [6]. There are many conflicting reports on the incidence of hearing loss associated with tympanic membrane perforations according to size, site and duration.

We were unable to establish a relationship between the type of perforation and the depth of hearing loss, however, in the series there is also a wide range of opinions regarding the multiple causes [4, 6, 14].

CONCLUSION

Tympanic membrane perforations are relatively common in our practice and are most often found in young subjects. Infectious otitis media remains the primary cause, followed by trauma. Tympanic perforation is a major cause of deafness. Its prevention requires a good management of infectious otitis and a mastery of foreign body extraction procedures.

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