

Original Research Article

Prevalence of otomycosis in the district hospital IV of Bamako, Mali

Sacko Hamidou Baba^{1*}, Kodio Aminata¹, Abdoul Razak Dicko¹, Timbine Lassina Gadi²

¹Department of ENT, District Hospital IV Bamako, Mali

²Rodolphe Mérieux Center, Bamako, Mali

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*Correspondence:

Sacko Hamidou Baba,

E-mail: sackohamidou85@gmail.com

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ABSTRACT

Background: Otomycosis is more and more found in chronic suppurative otitis media (CSOM), several factors (iterative antibiotic therapy, self-medication, general chronic diseases, climate), may explain this phenomenon which makes it more complex to start an adequate therapy. Objective was to highlight the place of otomycosis in chronic purulent otorrhea of the middle ear in tropical settings. Study settings were like the ENT unit of the reference health centre of commune IV of the district of Bamako, the Rodolphe Mérieux laboratory.

Methods: We identified the bacteriological samples taken in our unit between February 2009 and February 2018. The study involved 178 samples from a number of patients estimated at 148 with chronic purulent otitis media. All samples collected were transported and evaluated by both direct microscopic examination and culture method for bacteria and fungi examination, which were identified by standard procedures.

Results: The female sex predominated with 60.82%. The mean age of the patients was 27 years (range 5 months to 91 years). Among 170 samples, 36.19% yielded fungal growth, 59.7% grew bacteria and 50.94% showed mixed growth of fungi and bacteria. Major fungal isolates were candida species (n=38). 21 isolates were identified as *Aspergillus*.

Conclusions: This study will have made it possible to confirm the significant place of otomycosis in the chronic suppurative pathology of middle ear in our structure, requiring its consideration in the adequate treatment of CSOM.

Keywords: CSOM, Otomycosis, Tropical environment

INTRODUCTION

Ear infections are commonly encountered ENT diseases, the management of which very often poses problems in tropical environments.¹⁻⁵ Chronic purulent otorrhea is an obvious cause of fungal infection of the middle ear.⁵⁻⁸ Most of the authors have focused their attention on the involvement of bacteria in the pathological flora of the middle ear, very few studies have looked at the place of fungal germs in ear samples. Taking into account certain factors (unsuitable antibiotic and corticosteroid therapy, climate, etc.).⁹⁻¹³

Objectives were to determine the place of fungal infections in CSOM in Mali.

METHODS

A retrospective, descriptive study, with quantitative analysis was carried out from February of 2009 to February of 2018, based on the records from the ear, nose, and throat diseases unit of the reference health centre of commune IV of the district of Bamako. The 148 patients clinically diagnosed to have CSOM were included in this study.

The exclusion criteria for our study were: Patients with acute otitis media in its suppurative phase, drained otitis externa and purulent otorrhea less than two weeks old.

Derived from external auditory ear canals, debris, or exudate samples of 148 patients (2 swabs from each patient, one for microscopic examination, the other for culture) having otomycosis based on clinical diagnosis were subjected to mycological analysis. These samples were obtained from the external auditory canal controlled by aseptic settings by means of sterile cotton swab and directly sent to mycology lab for direct microscopic examination and fungal culture for confirmation of diagnosis. For diagnosis of otomycosis, detailed history (age, gender, residence, occupation, duration of the disease, laterality and otological symptoms), clinical examination, otoscopic results as symptoms), well as fungus laboratory identification were measured. Each swab is subjected to direct microscopic examination with 10% KOH and culture on Sabouraud's dextrose agar (SDA) and blood agar. Filamentous fungal growth is identified by macro- and micro morphological characteristics. Yeast like growth is identified by (API 20C) AUX (Bio Mérieux, France).

Data was analysed with a statistical software program (SPSS statistics for Windows version 20). Categorical data was presented as frequencies and percentages.

Consent was taken from all patients involved in the study.

Ethical approval not required.

RESULTS

The 170 samples were collected (as some had bilateral affection). The mean age of included patient group 27. 60.82% of the study population was females and 39.18% were males, equivalent to a number of 90 females' subjects and 58 males' subjects (Table 1). The ear involvement was unilateral in 148 patients and bilateral in only 22 patients (Table 1). We identified 163 positive samples out of the 170 in the study, 104 (63.80%) showed both bacterial and fungal elements, 59 (36.19%) were fungal germs in 51 patients, 7 samples returned sterile after culture (Table 1). The age groups 0 to 2 years and 26 to 40 years were mainly affected by otomycosis with respectively 10 cases (19.60%) and 9 cases (17.64%) (Table 2).

The characteristics of the mycotic germs identified in the study are shown in Table 3.

Table 1: The general characteristics of the patients in the study.

Patients	N	Percentage (%)	
Sex	Females	90	60.82
	Males	58	39.18
	Total	148	100
Ear involvement	Unilateral	148	87.05
	Bilateral	22	12.95
	Total	170	100
Samples	Mixed isolates (bacteria and fungi)	163	100
	Fungi isolated	59	36.19
	Sterile	07	4.11

Average age=27 years (Extremes of 05 months-91 years).

Table 2: Age distribution of study subjects with otomycosis.

Age (years)	N	Percentages (%)
0-2	10	19.60
3-5	03	5.88
6-10	05	9.80
11-15	03	5.88
16-25	03	5.88
26-40	09	17.64
41-50	06	11.76
51-60	05	9.80
61-70	04	7.44
71-80	03	5.88
Total	51	100

Table 3: The characteristics of the mycotic germs identified in the study.

Variables	N	Percentages (%)
Samples		
Single species of fungi	23	43.39
Several species of fungi	03	5.67

Continued.

Variables	N	Percentages (%)
Fungi and bacteria isolated	27	50.94
Total	53	100
Fungi isolated from samples		
<i>Candida albicans</i>	19	32.20
<i>Candida non albicans</i>	18	30.50
<i>Candida guilliermondi</i>	01	1.69
<i>Aspergillus flavus</i>	04	6.77
<i>Aspergillus fumigatis</i>	03	5.08
<i>Aspergillus niger</i>	10	16.94
<i>Aspergillus Spp.</i>	03	5.08
<i>Paccilomyces spp.</i>	01	1.69
Total	59	100

DISCUSSION

Otomycosis is more frequently observed in hot and humid climates and various individual, as well as environmental factors, predispose to this infection.^{10,11,14,15}

Otomycosis is a superficial, sub-acute or chronic infection of the external auditory canal, characterized by pruritis, inflammation, pain and itching commonly seen in tropical and subtropical regions of the world. Various host and environmental factors can predispose a person to otomycosis. However, a clinical presentation along with otoscopic observations of the patients shows fungal and bacterial infections.^{4,16} The share of mycoses in chronic purulent otitis media is often neglected by the practitioner, while more and more factors favoring this presence of otomycotic germs such as iterative local antibiotic corticosteroid therapy, untimely microtrauma of the external auditory canal, primary or secondary immuno-deficiency, poorly adapted treatment, low socio-economic status are mentioned.^{3,8,15,17} Fungal infections of the middle ear are common as fungi thrive well in moist pus.^{4,18,19}

Our study confirmed the significant place of mycotic samples in chronic otitis media in our service. In Mali, we have practically no studies on the subject.

We have noted 36.19%, this rate is high in some works in tropical Africa: Djohan et al (RCI)-46.50%, Ekpo et al (Cameroon)-32.4%, a low rate was reported by Onotai (Nigeria)-14.9%.^{4,8,10}

Sex

In our study the female sex predominated 60.82%, Djohan et al RCI, obtained 52%, Ekpo et al (Cameroon)-52%, Onotai et al (Nigeria)-50.4%. This rate is lower in the study of Aremu et al Nigeria-44%.^{4,8,10,14}

Age

We found an average age of 27 years, similar to the rate mentioned by Djohan et al (RCI)-27 years and Aremu et al (Nigeria)-27.8%.^{10,14}

The age groups concerned were mainly 0-2 years (19.60%) and 26-40 years (17.64%).

Our rates are close to those of Djohan et al (RCI), who obtained for the age groups of 0-10 years-23.8% and for the 30-40 years- 20.8%.¹⁰ On the other hand, in Morocco, in the study by Aboulmakarim et al the age group from 21 to 40 years seems to be mainly concerned with a much higher rate compared to ours 55%.¹⁹ Onotai et al was observed for the age group from 1 to 10 years-30.7%.⁸

Nature of the mycotic germs found

The most commonly found fungi in CSOM are *Candida* species and *Aspergillus* species.^{8,13,18,19} In our study: *Candida albicans* (32.20%) and non-albicans (30.50%) and *Aspergillus niger* (16.94%). Djohan et al RCI obtained 48.90 for candida and 21.04% for *Aspergillus*.¹⁰ Pontes et al (Brazil), *Candida albicans*-30%.⁵ In other studies, *Aspergillus* is mostly mentioned: Aboulmakarim et al Morocco found for *Aspergillus niger* 35% and candida 13%. Aremu et al Nigeria, *Aspergillus niger*-56% and *Candida albicans*-19.8%.¹⁴ Ekpo et al (Cameroon)-*Aspergillus niger*-44.38% and *Candida albicans*-28.40%.⁴

Multi-microbial and mycotic samples

This combination of bacteria and mycoses in the samples are very important to take into account in the rational management of our patients, in order to avoid complications, as cited in many studies.^{4,8,10,20} In our study we noted 27 cases (50.94%), Aremu et al Nigeria, obtained a rate similar to our 56.4%.¹⁴ Ekpo et al (Cameroon) reported a lower rate 32.44%.⁴

Limitations

We limited ourselves solely to a panoramic assessment of the bacteriological profiles of the trailing purulent otitis media, we could not consider the predisposing factors in our patients, their occupations and associated pathologies. The next studies will allow us to perfect our shortcomings on the subject.

CONCLUSION

Otomycosis is a disease not to be neglected in suppurative otitis especially in tropical environments, where we are confronted with several predisposing factors for this common otologic pathology. It is important not to neglect the special nature of the samples (combination of bacteria and mycoses) for the conduct of an adapted therapy. We should focus on ENT health education, an important component in preventing otologic conditions by educating patients on behaviors favorable to good ear hygiene.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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