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Research Article

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Otomycosis: Retrospective Study at the Parasitology-Mycology Department (Mohammed 5th Military Hospital – Rabat, Morocco)

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Abstract

Background: Otomycosis is a superficial fungal infection of the external auditory canal (EAC), with high prevalence in tropical climates.

Objective: To evaluate frequency, etiology, risk factors, clinical features, and diagnostics of otomycosis in Morocco and compare them with national and international data.

Methods: Retrospective analysis of 110 patients seen in 2024 at a Moroccan military hospital. Laboratory diagnosis was confirmed by microscopy and culture.

Results: Of the 110 patients, 73 (66.4%) were confirmed to have otomycosis. Women were more affected (68%). The predominant symptom was otalgia (66%), and the main risk factor was cotton swab use (60%). Aspergillus niger (25%) was the most commonly isolated pathogen.

Conclusion: Otomycosis is prevalent in Morocco, especially among women. Risk factors like ear manipulation should be targeted in public health campaigns. Findings align with trends observed in similar climate zones.

Keywords: Otomycosis, Fungal Ear Infection, External Auditory Canal (EAC), Aspergillus Niger, Candida Species.

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Introduction

Otomycosis is a superficial fungal infection of the external auditory canal, frequently encountered in clinical practice, particularly in warm and humid climates. It presents with symptoms such as otorrhea, otalgia, and pruritus, often mimicking bacterial otitis externa. Several factors favor the development of otomycosis, including excessive ear hygiene (e.g., cotton swab use), local trauma, dermatologic conditions, and systemic illnesses such as diabetes mellitus. Despite its frequency, otomycosis is often underdiagnosed or mismanaged due to the absence of systematic mycological testing in many clinical settings.

This study aimed to determine the prevalence of otomycosis in patients attending the Mohammed V Military Teaching Hospital in Rabat and to analyze the clinical, epidemiological, and mycological characteristics of the infection.

Materials and Methods

A retrospective, cross-sectional study was conducted from January 2023 to November 2024 at the Parasitology-Mycology Department of the Mohammed V Military Hospital in Rabat. A total of 110 patients presenting with otological symptoms were included. Samples were taken from suspected cases for mycological examination, including direct microscopy with KOH and culture on Sabouraud Dextrose Agar. Yeasts were identified using the automated VITEK® system.

Results

Out of 110 patients, 73 were confirmed to have otomycosis, corresponding to a prevalence of 66.4%.

Demographic Data

The age distribution showed that the most affected group was between 40 and 60 years

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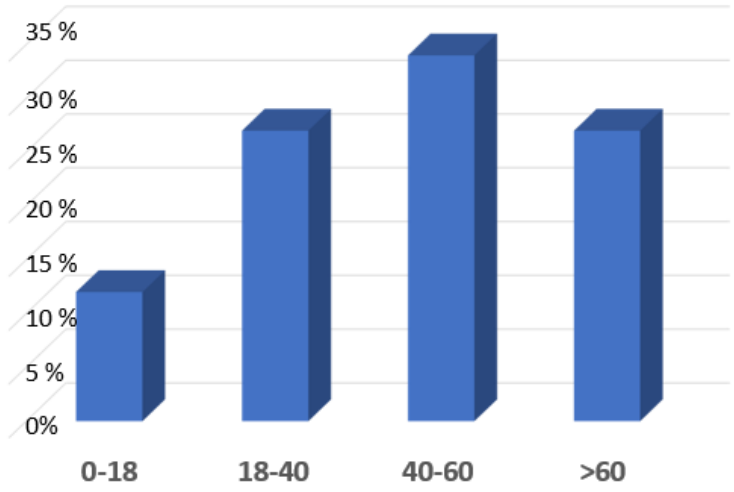
(34%), followed by those aged 18-40 years (27%). This could reflect the increased exposure to environmental and occupational risk factors in this age bracket. Pediatric cases were relatively low (12%), possibly due to more frequent medical consultations for bacterial otitis in this group. Females represented 68% of cases, suggesting behavioral or cultural contributors, such as more frequent ear hygiene or veil wearing.



Age group	Number	Percentage
0-18	13	12%
18-40	30	27%
40-60	37	34%
> 60	30	27%

Figure 1: Age wise distribution of otomycosis cases

Clinical Presentation

Otalgia (66%) and otorrhea (59%) were the leading symptoms. Pruritus, reported in 18% of patients, is characteristic of fungal origin but less frequently the main complaint. Hypoacusis was less common (9%) and likely associated with debris accumulation. The symptom pattern aligns with previous findings in India and Egypt, reinforcing the importance of fungal etiology in chronic or recurrent otitis externa.

SYMPTOMS	PERCENTAGE
Otalgia	66,36%
Otorrhea	59,09%
Otitis	72,72%
Otalgia + Otorrhea	41,81%
Otitis + Otalgia	32,72%
Itching	18,18%
Hypoacusis / Hearing loss	9,09%
Hypoacusis + Otorrhea	8,18%
Tinnitus	5,45%
Fever	3,63%
Otorrhagia	1,81%
Necrotic lesion	1.81%

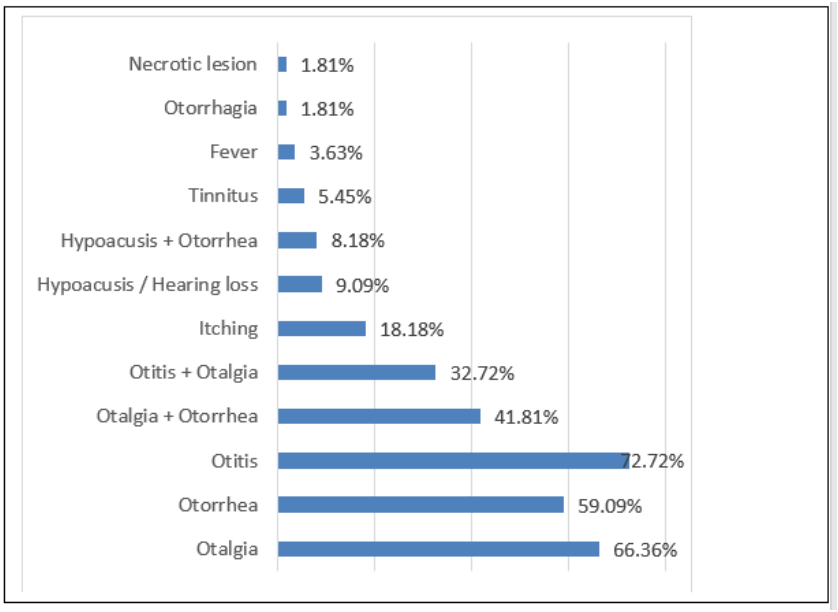


Figure 2: The Symptoms

Predisposing Factors

Cotton swab use was the predominant risk factor (60%), consistent with literature describing its disruptive effect on the protective cerumen barrier. Other notable contributors included tympanic membrane perforation (9%), veil/turban wear (9%), and sauna exposure (7%), all of which promote a moist and warm microenvironment favorable to fungal growth.

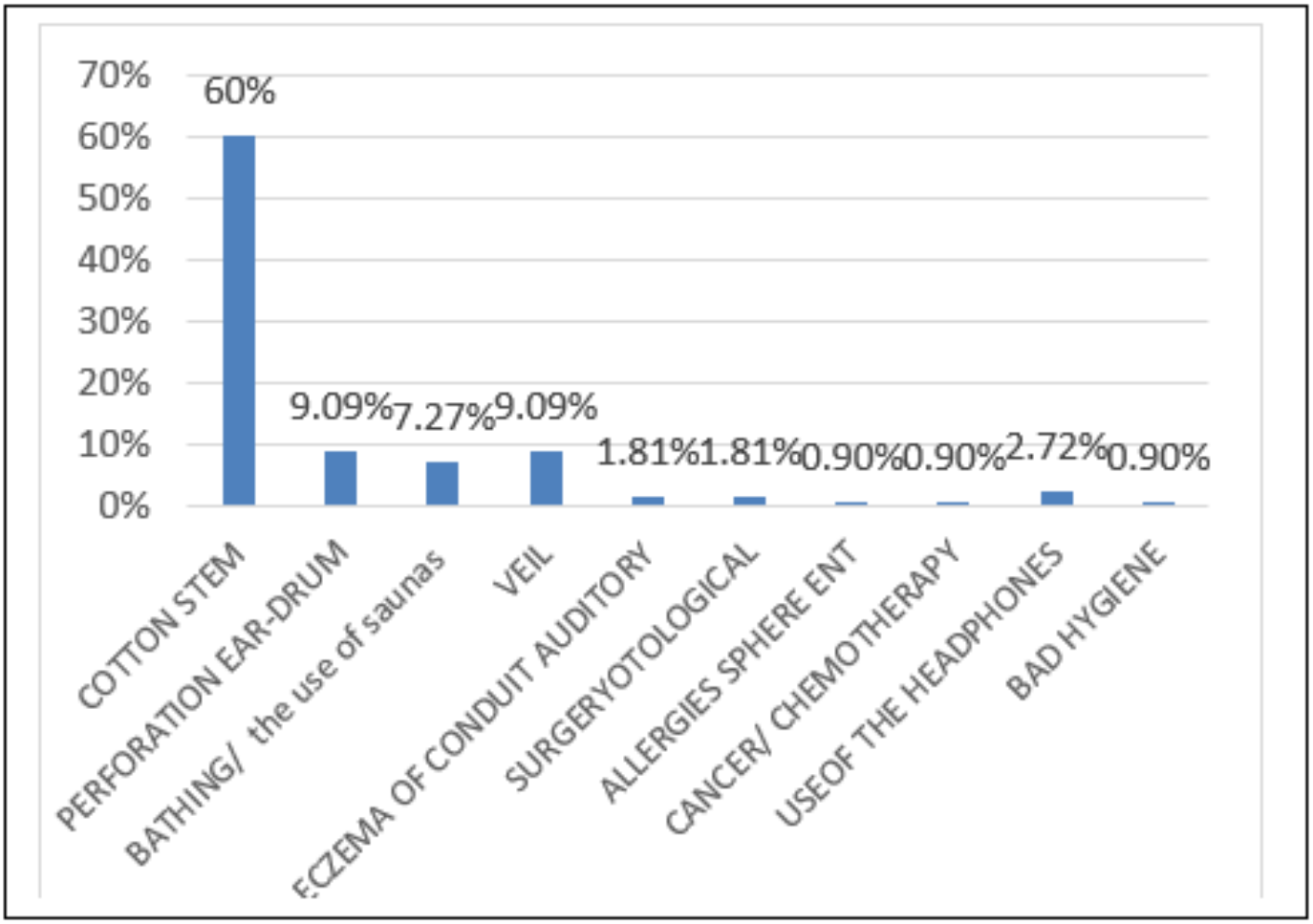


Figure 3: Predisposing Factors for otomycosis

Preexisting Diseases

Daibetes kind 2 was present in 17.8%, underscoring immunocompromised status as a critical factor

preexisting diseases	Number	Percentage
Diabetes kind 2(DT2)	19	17,27
DT2+HTA	3	2,72
Diabetes kind 1(DT1)	4	3,63
DT1+ HTA	3	2,72
high blood pressure (HTA)	6	5,45
Dyslipidemia	1	0,90

Figure 4: Preexisting Diseases

Mycological Findings

Direct microscopy was positive in all cases and aligned perfectly with culture results. Aspergillus niger was the predominant species (25.45%), followed by Aspergillus fumigatus (13%) and Candida parapsilosis (12%). The relatively high rate of Candida species highlights a trend noted in recent studies, suggesting a shift in fungal ecology, possibly driven by antibiotic use and patient comorbidities.

Fungal species	Number	Percentage
A.niger	28	25,45%
A.fumigatus	15	13,63%
C.parapsilosis	14	12,72%
A.flavus	5	4,54%
C.tropicalis	6	5,45%
C.albicans	6	5,45%
C.albicans + *Fusarium spp*	1	0,90%
C.parapsilosis + *C.tropicalis*	1	0,90%
Aspergillus spp	1	0,90%
C.dubliniensis	1	0,90%
A.Terreus	2	1,81%
C.parapsilosis +*A.niger*	3	2,72%

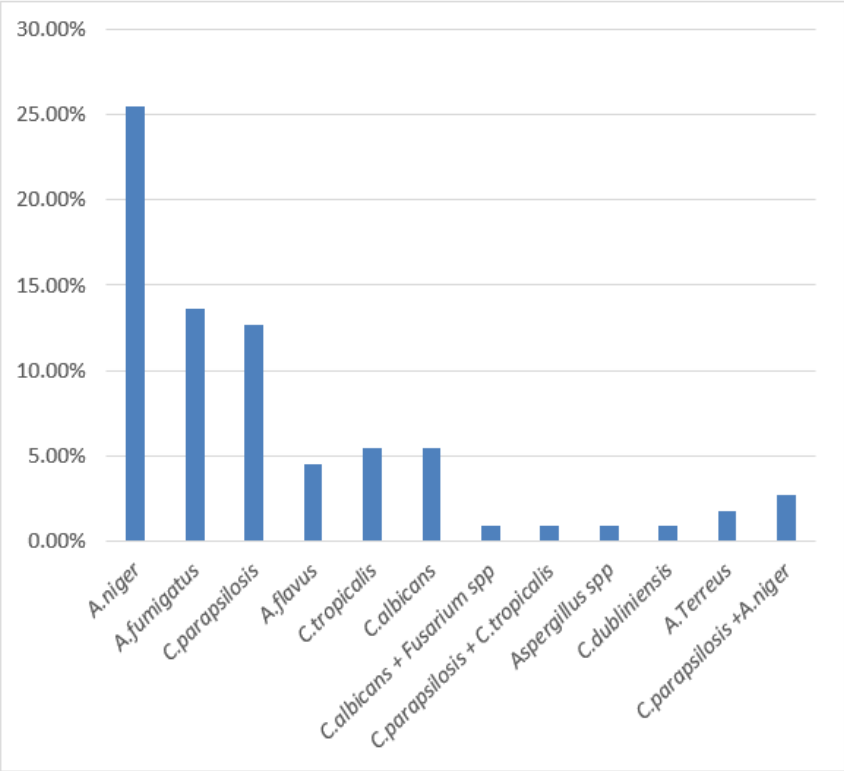


Figure 5: Types of fungal isolates in otomycosis cases

Discussion

Otomycosis is a superficial fungal infection frequently encountered in ENT practice—particularly in tropical and subtropical climates that offer humidity and warmth conducive to fungal proliferation. According to the literature, the diagnosis is most often made in adults over 35 years of age. The otomycoses can meet in healthy subjects and without notable antecedents, but most often there are many involved factors such as recent treatment with antibiotics, changes in skin pH or antibacterial properties of cerumen, recent otologic surgery or traumato the external ear canal. In general, all conditions inducing local immunodeficiency, such as local corticosteroids treatment for eczema in the external ear canal, increase the risk of developing otomycosis [1]. In recent years, there has been a dramatic increase in the incidence of mycotic infections and in the diversity of pathogenic fungi.

In our retrospective study at the Mohammed V Military Hospital in Rabat, Morocco, the prevalence of otomycosis was 66.4%, highlighting a significant clinical burden. This rate aligns with regional and international findings: Ait Ouzdi et al. reported a prevalence of 41% among patients at the Avicenne Military Hospital in Marrakech, demonstrating that otomycosis is widespread even within Morocco [2]. Barati et al. observed an even higher prevalence of 69% in their clinical and mycological study conducted in Central Iran [3]. However, in Ivory Coast, Nigeria and India, very high rates of 78.3%, 80% and 95.5% respectively were reported. In these tropical and subtropical countries, high humidity, warm weather and dust in the environment promote the spread and growth of molds [4-6]. These comparable prevalence levels—across different countries but similar climates—underscore the influence of environmental conditions on otomycosis risk. They also suggest that climate-adapted preventive strategies and heightened clinical vigilance are crucial in these endemic settings.

The demographic distribution in our cohort showed a female predominance (68%), which is in partial agreement with Kulal et al. (2017) in India, who also observed slightly more female patients (53.3%) in their series [7]. However, a study by Yahia et al. (2021) in Egypt reported more male cases (54%) [8], indicating that gender distribution may vary regionally [8]. Regarding age, Kulal et al. found the highest prevalence in the 11–30-year group (42.6%), while our study identified the 40–60-year bracket (34%) as the most affected, suggesting possible environmental or occupational influences specific to our population [7].

In terms of clinical presentation, otalgia (66%) and otorrhea (59%) were the predominant symptoms in our study. These findings are different to those of Singh and Sudheer, who reported itching as the most common symptom (89%), followed by ear ache [9]. In contrast, pruritus was reported in only 18%. Hypoacusis (9%) was relatively rare in our cohort and was likely due to obstruction of the external auditory canal by fungal debris, a finding consistent with the concept of “mycotic plugs” described in the literature.

The most important predisposing factor identified was cotton swab use (60%). This behavior was also emphasized by Olaosun in Nigeria, where 93.4 % of young adults reported self-ear cleaning, with 85.1 % using cotton swabs, a practice linked to potential ear trauma and increased otomycosis risk [10]. Other contributing factors in our study included tympanic membrane perforation (9%), veil use (9%), and sauna exposure (7%). Similar environmental and cultural determinants were noted in studies from Marrakech and Egypt [2, 8].

In southern India and Ivory Coast, the prevalence of self-cleaning history was significantly higher in the otomycosis group compared with the control group [11, 12]. Indeed, the obsessive manipulation of the outer ear by cotton swabs or hard objects such as wooden sticks to clean the ear or relieve itching causes a lack of ear wax which can lead to drying of the stratum corneum, which may contribute to the development of inflammation of the ear canal. As well as microtrauma on the skin of the external auditory canal and the deposition of fungal conidiain the wound leading to a fungal infection [13-15]. Indeed, in Turkey, 27% of patients with otomycosis bathed frequently in the pool or the sea and 23% had frequented the thermal baths which is consistent with our findings, 35% of otomycoses cases were related to frequent swimming, especially in the ther malbaths [16]. The use of local antibiotherapy imbalances the flora of the external auditory canal in favor of micromycetes as well as the use of local steroids (with or without antibiotics) [17]. In another study, the authors found that the risk of contracting otomycosis was 9-fold higher in patients who misused such ear treatments [11]. In another work, the authors also showed that the prevalence of the use of ear drops was significantly higher in the group of otomycoses compared to the control group (20% versus 9%) [12].

Comorbidities, particularly diabetes, played a significant role in our cohort, with type 2 diabetes mellitus observed in 17.27% of patients. This immunocompromised state facilitates fungal colonization and aligns with findings by Viswanatha and Naseeruddin, who reviewed fungal ear infections in immunocompromised individuals [18]. The association between chronic diseases and otomycosis also supports the inclusion of systemic evaluation in the clinical management of such patients.

From a mycological perspective, Aspergillus niger was the most frequently isolated species in our study, accounting for 25.45% of isolates, followed by A. fumigatus (13.63%) and Candida parapsilosis (12.72%). Other fungi included A. flavus (4.54%), Candida tropicalis (5.45%), and Candida albicans (5.45%). Mixed infections such as C. albicans with Fusarium spp. and C. parapsilosis with A. niger were also observed.

These findings partially align with Kulal et al., who reported a predominance of A. niger (49.63%) and Candida species (34.82%), although their percentages differ, possibly due to variations in geographic and clinical characteristics [8]. Singh and Sudheer reported Aspergillus as the dominant genus in 63% of otomycosis cases, with A [6]. niger and Candida albicans each around 10%, but no precise data on C. parapsilosis. The main isolates were A. niger (37%), A. flavus (19%), A. fumigatus (11%), and C. albicans (16%). Chauhan and Surender identified Aspergillus species as the predominant pathogens in 69% of otomycosis cases, followed by Candida species in 18% [16]. Among Aspergillus isolates, A. fumigatus was the most frequently encountered (37%), followed by A. niger (20%) and A. flavus (12%).

In Europe, Candida albicans most frequently isolated species, followed by Aspergillus niger and Aspergillus flavus. Aspergillus fumigatus, which poses the most therapeutic problems, is rarer [19]. In the subtropical countries as well as in Morocco, the ratio is reversed with a predominance of Aspergillus. According to a prospective study in the Department of Otolaryngology and Maxillofacial Surgery at Rabat Specialty Hospital, a dominance of filamentous fungi compared to yeasts was found. In the filamentous fungi, two species were incriminated, A. niger and A. flavus. Yeast-like fungi are exclusively represented by the genus Candida [20]. In Mexico, the authors also noted the predominance of molds (63.9%) with A. flavus (26%) on yeasts dominated by C. albicans (26.8%) [21]. In Brazil, yeasts predominated with C. albicans (30%), C. parapsilosis (5%), C. tropicalis (5%) compared with filamentous fungi represented by A. niger (20%), A. flavus (10%) and A. fumigatus (5%) [22]. In a Nigerian study, it was noted that the main agents of the predominant otomycoses are the fungi of the genus Aspergillus (63.2%) with A. fumigatus (39.5%) and on the fungi of the genus Candida (35.5%) with C. albicans (18.4%) [5]. While the predominant etiologic agents in another study were C. albicans (28.3%) and A. fumigatus (5.7%) [23]. In Iran, A. niger is the most involved fungus in otomycosis (62.9%) [24]. In Spain, the predominantly isolated agents are filamentous fungi with A. flavus (42.4%), A. niger (35.9%) and A. fumigates (12.5%) [25]. While in Poland otomycosis is most often caused by fungi of the genus Candida (60%) [26].

The diagnostic confirmation was achieved via direct microscopy and culture, with full concordance between the two, validating the reliability of conventional diagnostic approaches. However, rapid and accurate species-level identification remains essential, particularly for Candida isolates. As noted by Neppelenbroek et al., a combination of phenotypic and molecular tools ensures better clinical management [27].

In summary, our findings are consistent with those of several international studies in terms of species prevalence, clinical presentation, and risk factors. However, the rising presence of Candida species and mixed infections warrants attention. Public health interventions should emphasize the risks of ear manipulation and the importance of prompt medical consultation.

Conclusion

Our retrospective study highlights the significant prevalence of otomycosis in Rabat, Morocco, affecting primarily middle-aged women. The disease remains strongly associated with modifiable behaviors such as ear cleaning with cotton swabs, wearing occlusive head coverings, and exposure to moist environments. Aspergillus niger continues to dominate the microbiological landscape, though the rise of non-albicans Candida species warrants attention. Comparisons with national (Marrakech, Rabat) and international (Nigeria, Iran, India, Turkey) studies reinforce the climate and culture-dependent nature of otomycosis.

Public health strategies must promote proper ear hygiene, reduce self-medication, and encourage early consultation. ENT specialists should consider mycological testing in cases of recurrent or atypical otitis externa. Further prospective multicenter studies are needed to monitor species evolution and antifungal resistance patterns across Moroccan regions and beyond.

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