Original article

Otomycosis in western Nigeria

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Summary

Otomycosis is a recognized clinical entity in the tropical regions of the world. However, there is scanty information on this disease in some parts of Sub-Saharan Africa. The aim of this study was to determine the prevalence and pattern of etiological agents of otomycosis in western Nigeria. Medical records of patients with otomycosis seen in the Otorhinolaryngology Department of the University College Hospital, Ibadan from 1996–2005 were reviewed for all essential clinical data. Of the 5784 patients with ear diseases, 378 (6.54%) had otomycosis which consisted of 145 (38.36%) males and 233 (61.64%) females. Seventeen patients (4.50%) had recurrence within six months of treatment, 4 (1.06%) had poorly controlled plasma glucose. A significant number of our patients, 52 (13.76%), had prior topical aural antibiotic treatment following misdiagnosis. The predominant etiological agents in our series were *Aspergillus niger* (48.35%) and *Aspergillus fumigatus* (33.96%).

Key words: *Aspergillus* spp, *Candida albicans*, Nigeria, otomycosis, predisposing factors.

Introduction

The term otomycosis simply refers to a superficial fungal infection of the external auditory canal. It is sometimes associated with bacterial infection in its status as an opportunistic infection. The epidemiology of otomycosis is global; however, the hot, humid and dusty environment of the tropics and subtropics makes otomycosis more prevalent in these regions.[1] The infection may be acute, subacute or chronic and usually present with itching of the ear, otalgia, aural fullness, hearing impairment and tinnitus. The accompanied inflammation is associated with superficial epithelial exfoliation and formation of masses of debris containing hyphae, which further worsen the discomfort and sometimes culminate into frank suppuration in the affected ear.[2]

Most severe cases of otomycosis, with tympanic membrane perforation, middle ear and sometimes whole temporal bone involvement are associated with immunosuppresion.[3] Multiple and prolonged use of broad spectrum antibiotics, trauma, persistent otorrhoea and swimming have been documented as predisposing factors.[1,4–6] A wide variety of fungi have been implicated in the causation of mycotic infection of the ear; the most common organisms include *Aspergillus* and *Candida* species. Other less frequently involved fungi include *Penicillium*, *Mucor* and *Rhizopus* species.[2,7] Pure or mixed fungal isolates could be responsible for either a unilateral or bilateral otomycosis.[8]

Despite the fact that our climatic condition may encourage otomycosis, there is dearth in literature and limited knowledge on this disease entity in our environment, hence, the need to create awareness among healthcare providers and the entire populace on this disease. The aim of the study was to determine the prevalence of causative organisms of otomycosis in western Nigeria, and also to evaluate the predisposing factors.

Materials and methods

This was a retrospective study of all patients referred, seen and managed for otomycosis at Otorhinolaryngology Department of the University College Hospital, Ibadan, Nigeria over a 10-year period (1996–2005). The data collected from the medical records included demographic data, clinical features and fungal culture

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results, management and outcome of the disease. In the study centre, all ear swabs were usually transported in 10% KOH to the laboratory for direct microscopy and inoculation on Sabouraud dextrose agar for culture. The results were presented in tables and simple descriptive forms. The statistical analysis was performed using Statistical package for social sciences version 11.

Results

In all, 5784 cases of infective ear diseases and 1389 cases of otitis externa were seen within the study period of which 378 cases (6.54%) were of otomycosis. The diagnosis was confirmed by isolating the fungal species via mycology study of specimen in the ears. There were 145 males (38.36%) and 233 females (61.64%) with a sex ratio (M : F) of 2 : 3. The age ranged from 4 to 87 years with a mean age of 42.01 years. The most prevalent age groups are in 3rd and 4th decade of life which constitutes 18.25% and 19.31% respectively. Most of the patients had unilateral otomycosis, 174 (46.03%) right and 158 (41.80%) left ears, while bilateral aural involvement was in 46 patients (12.17%). The duration of symptoms before presentation ranged from 2 days to 3.5 years. Three hundred and twelve (82.54%) patients gave history of frequent scratching of the external ear canal with either the tip of their fingers and objects like matchstick, pen cover, broom stick, feathers or cotton bud. The symptoms that these patients presented with were similar to what had been widely reported in the literatures.[2,4] The most common mode of presentation included aural pruritus, otalgia and tinnitus (Table 1).

Twenty-three cases (6.08%) of otomycosis in this study occurred in known diabetes mellitus patients, while two (0.53%) of the patients were positive for retroviral infections. Seven (1.85%) of the patients had underlying malignancies of the sinonasal (28.57%) and nasopharyngeal (71.43%) regions. Fifty-two patients (13.76%) had history of topical antibiotic instillation into the external auditory canal while 126 (33.33%) had history of multiple oral antibiotic usage within 12 months prior to presentation. Four (1.06%) of our patients were pregnant.

Table 1 Symptomatology of otomycosis

Symptoms	Incidence (%)
Aural pruritus	341 (90.21)
Otalgia	317 (83.86)
Ear discharge	29 (7.67)
Tinitus	296 (78.31)
Hearing impairment	56 (14.81)
Feeling of aural blockage	92 (24.34)

Table 2 Distribution of fungal isolates from the ear swabs

Fungal isolate	Incidence (%)
Aspergillus niger	205 (48.35)
Aspergillus fumigatus	144 (33.96)
Candida albicans	52 (12.26)
Aspergillus flavus	23 (5.43)

The results of fungal culture of the ear swabs are as shown in Table 2. *Aspergillus* and *Candida* species were the fungal isolates found in this study as identified by direct microscopy and culture. These were illustrated by pictures taken via video-otoscopy in Fig. 1 and Fig. 2 respectively. There was no record of mixed fungal isolates.

The mode of treatment was conservative: ear syringing for those with fungal balls and aural toileting followed by daily aural dressing with imidazole group of antifungal agents for 2–6 weeks, depending on severity. Seventeen patients (4.50%) had history of recurrence of the disease within 6 months of treatment.

Discussion

Otomycosis is a recognised clinical entity in the tropical region of the world. This could be as a result of the high degree of humidity and heat in the region. Besides, large proportion of the population is made up of outdoor labourers who are constantly being exposed to the dusty environment. The habit of cleaning the

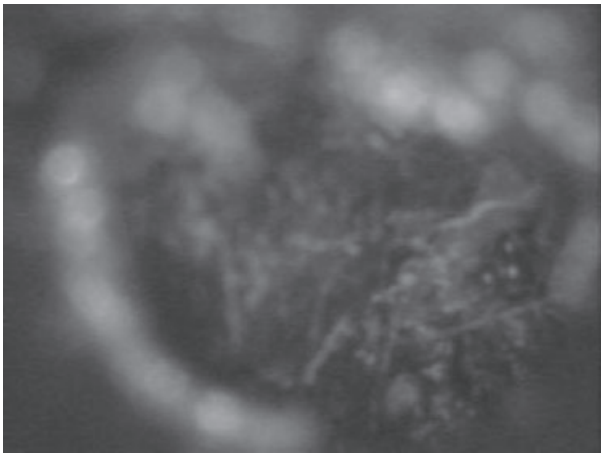

Figure 1 *Aspergillus niger* growth almost completely filling the external auditory meatus.

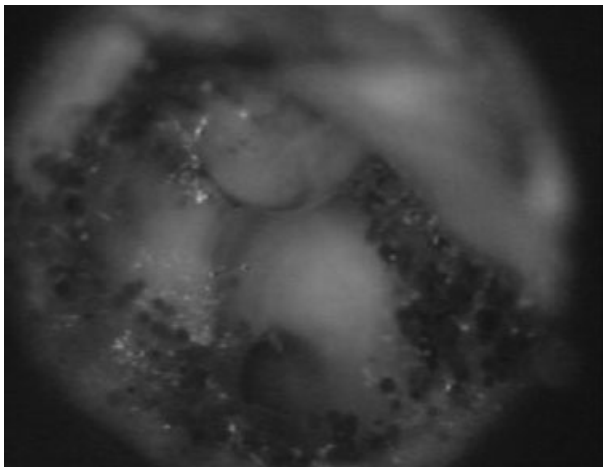

Figure 2 Fulminating *Candida albicans* infection of the ear in a perforated tympanic membrane exposing inflamed middle ear mucosa.

ear with feathers, matchstick and contaminated finger tips is known to encourage the inoculation and growth of the spores of fungus on the moist external auditory canal especially in patient with poor personal hygiene.[9]

A previous study on otomycosis had shown a prevalence of 6%,[10] which is similar to what was observed in our study (6.56%). The prevalence of this disease among patients with otitis externa is 27.20% in this study. This is however higher than what was observed in similar studies done in northern and south-east parts of Nigeria where otomycosis constituted 15.90% and 6.80% of otitis externa respectively.[11,12] All age groups seem to be affected, although the occurrence appears to be more in the early adulthood with 52.64% of the cases occurring between the age 20 and 49 years which is similar to the finding from a previous study.[13] In this study, there were fewer males than females and this may suggest that the females generally seek medical helps for their ailments more than the males. Other reasons could be attributed to some cultural practices such as the traditional head scarf and 'hijab' commonly worn by African women. This practice is associated with the prolonged covering of the external auditory canal which increases the humidity within the ear canal and hence predisposes to otomycosis.[14] Besides, the use of dryer in the washing and setting of hairs by women also increases the humidity in the external auditory canal and this encourages otomycosis.

Otomycosis may be indistinguishable from bacterial otitis externa although itching is usually worse in the former.[14] The similarities in presentation often result in misdiagnosis and inappropriate treatment with topical antibiotics by inexperienced personnel. Sometimes, some of the patients resort to self medication and multiple antibiotic abuses prior to presentation to the appropriate physicians. These practices eliminate the bacterial flora, which further encourages the growth of fungus in the moist external auditory canal.[1,5]

Immunocompromised patients are known to be more prone to having otomycosis.[3] The common predisposing factors to immunosuppression in our environment include diabetes mellitus, malignancy and HIV infection. Drugs (steroid and cytotoxics) and sometimes physiological conditions like pregnancy are also known predisposing factors.[14] In this study, 6.08% of the patients had associated diabetes mellitus, 0.53% were positive for retroviral infection, 1.85% had underlying malignancies while 1.06% of our patients were pregnant.

About 5% of the patients were found to have recurrence of the otomycosis after treatment which is similar to the findings from the literature.[2,7,13] Sixty-five per cent of these patients with recurrence had topical aural antifungal treatment for 2 weeks. This may be due to the fact that fungal elements may not have been completely eradicated within this period and may re-germinate if the condition is favourable. Some of these patients may have had inadequate aural dressing with antifungal agents due to poor understanding of the need for prolonged treatment. This might predispose to development of resistance to the antifungal agent being used for treatment. Four of the patients with recurrence had poorly controlled plasma glucose because of non-compliance with their hypoglycaemic medications. Hyperglycaemia usually provides a good culture environment for fungus to grow hence the need to have a normal blood sugar level. The two patients with HIV infection had recurrence and had to be managed with a combination of topical and systemic (oral) antifungal.[3] Swimming is one of the documented predisposing factors to otomycosis.[10] However, not many people swim in this part of the world and therefore only one (0.26%) of our patients was a professional swimmer.

The diagnosis of otomycosis is usually confirmed from fungal culture of the ear swabs. The aetiological agents of otomycosis found in our study were *Aspergillus* and *Candida* species with *Aspergillus niger* (48.35%) as the most preponderant (see Table 2). This agrees with previous similar studies[4,13,15–17] although at variance with the study by Kaur *et al.* [2] which

cited *Aspergillus fumigatus* as the most common mycotic agent. The prevalence of *Candida* species is much less in this study when compared with other similar studies carried out in other parts of Nigeria.[13,17]

Otomycosis could be asymptomatic but if left untreated, may lead to morbidity like hearing loss.[18] In our study, 56 (14.81%) patients had various degrees of conductive hearing impairments.

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