Incidence of Otomycosis and its causative factors

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ABSTRACT

Objectives: The study aimed at determining the incidence of otomycosis and to study the clinical social and microbiological features of otomycosis. The secondary objective of the study is to create awareness regarding the common causes of otomycosis and its preventing factors among patients. Materials and Methods: This is a prospective study conducted over a period of six months from January 2020 to June 2020 in the ENT Department at Saveetha Medical College and Hospital, Chennai, 350 consecutive patients who came to ENT OP with the complaints of itching, and ear pain were diagnosed by otoscopic examination as otitis externa were included in this study. Detailed history to identify the predisposing factor was elicited. General examination and otoscopic examination were carried out, ear swab was sent, and the collected data were entered in an excel spreadsheet and was analyzed using SPSS Software. Results: The incidence of Otomycosis in our study was found to be 14.8%. Manual workers were more commonly affected followed by housewives, farmers and students. Trauma to the ear by self-cleaning of the ears with sticks, ear buds was the common causative factors. Itching in the deep ear canal was the commonest symptom. Aspergillus Niger was the commonest fungi isolated. Conclusion: Regular long-term follow-up is necessary for effective treatment of otomycosis. Patient education is important for the prevention of otomycosis.

KEY WORDS: otomycosis; etiopathogenesis; predisposing factors


Introduction

Otomycosis or fungal otitis externa is seen as a common ENT problem in India. Otomycosis has been...
described as a subacute or chronic fungal infection of the external auditory canal. It is worldwide in distribution with prevalence ranging from 8 to 30% among the patients who are presenting with the clinical features of otitis externa. The frequency of otomycosis depends upon the different climatic conditions with higher prevalence seen in hot, humid and dusty areas of the tropics. Various factors have been proposed as predisposing factors to otomycosis which includes trauma to the external ear while self-cleaning by ear buds, metal sticks and instrumentation of the ear, increased use of antibiotic ear preparations, pouring of oil into the ear, absence of Cerumen and the presence of associated systemic diseases like diabetes and hypertension.

Most of the patients are suffering from severe itching, ear discharge and fullness in the ear. A wide spectrum of fungi can cause otomycosis and the most common offender is Aspergillus Niger. The other fungi which are isolated are Aspergillus Fumigatus, Aspergillus flavus and Candida albicans.

If not diagnosed and treated properly it may progress to tympanic membrane perforation and loss of hearing. Otomycosis is a challenging, frustrating and rarely life-threatening disease. Otomycosis usually requires prolonged treatment and regular follow up and is associated with higher chances of recurrence.

The study aims to determine the incidence of otomycosis in patients clinically diagnosed with otitis externa and study the clinic social microbiological features of otomycosis in patients coming to ENT OPD of Saveetha medical college.

Materials and Methods

This Prospective study was conducted in the Department of Otorhinolaryngology at Saveetha Medical College Hospital, Chennai and this study was performed over a period of 6 months from January 2020 to June 2020. A total of 352 consecutive patients, attending the outpatients Department of Ear, Nose & Throat with the complaints of itching, ear pain and discharge were diagnosed by otoscopic examination as otitis externa were chosen for this study.

A predesigned Performa was used to evaluate and analyze the demographic profile, predisposing factors presenting complaints and clinical findings of the patients. History of trauma to the ear by using wooden sticks, metal wax pickers or any other objects in an attempt to remove ear wax, instillation of oil into the ear, use of antibiotic ear drops or steroid ear drops, taking bath in tanks, ponds or swimming in swimming pools containing contaminated water, treatment for other ENT problems such as Chronic Otitis media, tympanic membrane perforation, prior aural procedures chronic diseases such as diabetes, hypertension and fungal diseases in other areas of the body were recorded. Complete general examination and ENT examination including otoscopic examination was carried out.

For the detection of the causative agents, three specimens of affected external canal were obtained with three separate sterile cotton swabs. The cavum of conchae and external meatus were cleaned with seventy percent isopropanol before attaining the swabs, to avoid infections. The first swab was processed for aerobic bacteria in 5%
sheep blood, chocolate and MacConkey agar. The second swab was placed into an anaerobic thioglycolate broth and the last was placed in Sabouraud dextrose broth with antibiotics for fungal organisms. Fungal cultures were evaluated for isolation of any fungal growth after incubation at 25 to 26 degree. The culture plates were examined for the presence of growth after 3 to 4 days. All culture plates were examined under the microscope, photographed and identified by the usual methods.

**Statistical analysis**
All the recorded data were collected and entered in an excel spreadsheet and was analyzed using SPSS software.

**Results**
In this study 350 consecutively diagnosed otitis externa patients were taken up for analysis over a period of six months from January 2020 to June 2020. The incidence of otomyco sis in this study was found to be 14.8% (52) among the patients who presented with signs and symptoms of otitis externa. Demographic details of the 52 patients with otomycosis are given in the table I.

Otomycosis was more common among the manual workers (19 patients – 36.5%) followed by housewives (15 patients–28.8%), farmers (11patients-21.1%) and students (7 patients–13.4%). Among the 52 patients in this study, The Right ear was involved in 27 patients (51.9%) and the Left ear was involved in 21 patients (40.3%) and in 4 patients (7.7%) bilateral involvement was seen. The predominance in the right ear was observed in this study. Otomycosis, in general, is a unilateral disease which is evident in this study. The presenting complaints of the patients is shown figure 1. The predisposing factors of otomycosis are shown in table II.

Distribution of fungal isolates is shown in figure 2. Fungi were isolated from all the 52 patients who were clinically diagnosed to have otomycosis. *Aspergillus Niger* complex was the commonest and this was seen in 38 patients (73.0%).

**Discussion**
Otomycosis is a superficial mycotic infection of the external ear and this has become a common ENT disease in India. This mycotic infection is characterized by itching, pain and severe discomfort. The prevalence of otomycosis in this study was 14.8% among the patients who presented with the signs and symptoms of otitis externa. The epidemiology of otomycosis varies geographically, and its occurrence is more common in warm and tropical countries.

The age distribution in this study revealed that otomycosis was more common between the age group of 21 to 40 years (48.07 %). Although the age and sex of the patients with otomycosis varied in several reports the

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incidence reported in this series was similar to the reports of Metwally et.al. (1), Mugliston.T.et.al, (2) Kaur.R.et.al. (3), and Barati.et.al. (4).

The incidence of Otomycosis was higher in the males (59.6%) than in the females (40.3%). The sex ratio in our study was 1.4: 1. The incidence of otomycosis was found to be more among males in the study conducted by B. Pradhan et.al. (5), B. Barati et.al. (4) and Mugliston.T.et.al, (2). The males have more outdoor activities when compared to females and this explains the increased incidence of otomycosis in males.

The incidence of otomycosis varies in different occupational groups. In our series, manual workers (36.5%) were more commonly affected followed by housewives (28.8%), farmers (21.1%) and students (13.4%). The aforementioned incidence in our series was in accordance with the series published by Ahamed et al (6). The higher incidence in manual workers can be explained by humid and dusty working conditions which are suitable for the initiation of otomycosis. Housewives are affected when they clean and sweep their dusty house floors which contain fungal particles. Fungi found abundantly in decaying plant matter and soil particles can be blown in the air and affect the farmers. K Wadhwani et al (7) have reported increased incidence of otomycosis in farmers in their series. The dust containing fungal spores is suspended in the air in the playgrounds and the students are exposed to fungi when they play. Ahamed et al (6) has reported increased prevalence of otomycosis in students when they are playing in the playgrounds.

The most predominant factor for otomycosis in our series was trauma to the external ear canal which was found in 29 patients (55.7%). Trauma to the external ear canal occurs when the patient uses match sticks or metal wax pickers in an attempt to remove wax or while rubbing the ears when the patient is having itching or otalgia. Ahamed et al (6) has reported trauma as a common predisposing factor for otomycosis in their series. The trauma to the external auditory canal favours deposition of fungal material in the wound causing a fungal infection. The presence of factors such as moisture, warmth and acidic ph. of the external auditory canal provides an ideal condition for the growth of fungi.

Water entry into the external ear canal while swimming in local ponds and swimming pools was reported in 23 patients (44.2%) as a predisposing cause in this series. K.R. Aneja.et.al (8) and Pradhan et al (5) have described that water entry into the ear while swimming as a predisposing factor for the initiation of otomycosis in their series.

History of topical use of antibiotic ear drops was seen as a predisposing factor in 28 patients (53.8%) in our series. The instillation of antibiotic ear drops for itching and pain has been reported as a predisposing factor in many series. Munguia et al (9) and Jackman et al (10) have described that excess use of antibiotic ear drops as a potential predisposing factor for initiation of otomycosis in their series.

Instillation of coconut oil into the ear was reported in 20 patients (38.4%) in this series. Some patients believe that coconut oil application into the ears is beneficial for many ear ailments. Jain et al (11) has presented coconut oil as a predisposing factor in their series.

The instillation of mustard oil into the ear is also associated with a high incidence of otomycosis. Some authors like Prathan et al (5) have reported that instillation of mustard oil as a predisposing factor for otomycosis.

Absence of Cerumen was seen in 44 patients (84.6%) in this study. Cerumen is said to have a protective role in the external auditory canal. Absence of Cerumen increases the chances of fungal infection. Paulose.K.O.et.al. (12) has reported that absence of Cerumen is associated with a high incidence of fungal infection in their series but some authors like Karur et al (3) and Yassin et al (13) claim that the presence of excess Cerumen favours the germination of fungal spores. Presence of systemic diseases like diabetes and hypertension is associated with a high incidence of otomycosis.

The most common complaint was severe itching sensation deep inside the ear canal and all the 52 patients (100%) presented with itching in our study. The other complaints were Fullness in the ear which was seen in 44 patients (84.6%), Pain in the ear seen in 40 patients (76.9%), Ear discharge seen in 28 patients (53.8%), Hearing Loss is seen in 12 patients (23.0%) and Tinnitus was seen in 6 patients (11.4%). Ashish et al (14) presented itching as the predominant symptom in otomycosis in their series. But Ho et al (15) reported otalgia as a major symptom followed by ear discharge and loss of hearing. Agarwal et al (16) reported blocked ear as a primary symptom followed by itching, pain and ear discharge. Otomycosis can also lead to tympanic membrane perforation and the disease may spread into the middle ear Prathan et al (5) and Hurst et al (17) have reported the perforation of the tympanic membrane and middle ear involvement in otomycosis in their series.

Recurrence otomycosis is very common and long term follow up is necessary. The Right ear (51.9%) was more commonly involved in our series. The predominant involvement of the right ear was reported by Ho et al (15) in their series. Otomycosis is a mostly unilateral disease. Paulose et al (12) and Yassin et al (13) reported unilateral involvement of otomycosis in their series. Bilateral involvement is more common in immunocompromised patients and this is reported by Viswanathan et al (18) in their series.

The isolation rate of fungi in otomycosis varies in different series. Aspergillus Niger was the most common Fungi species isolated from otomycosis cases in this study. Aspergillus Niger was isolated in 38 cases, (73.0%) followed by Aspergillus flavus in 6 Cases (11.5%), Aspergillus fumigatus in 3 cases (5.8%), Candida spp. In 3 Cases (5.8%) and Penicillium species in 2 cases(3.8%).

Aspergillus Niger is reported as the predominant fungi in otomycosis in most of the series. This is supported by
many authors like Viswanatha et al (18), Yehia et al (19) and Hashino et al (20) in their series. Karur et al (3) has reported that *Aspergillus fumigatus* and *Aspergillus flavus* complex as the most predominant fungi in their series. Pontes et al (21) and Jackman (10) have reported that *Candida albicans* has the predominant fungi in otomycosis in their series.

The aim of the study was to Creat of Awareness to patients. Patient education is necessary for the prevention of otomycosis. Patients were explained about the serious consequences of using ear buds, wooden sticks, and metal wax pickers in an attempt to remove the ear wax. Patients were advised to avoid home remedies for ear ailments, avoid taking bath in ponds and swimming pools containing contaminated water. Proper treatment of fungal diseases which is present in other areas of the body and proper treatment for systemic diseases like diabetes and hypertension was insisted.

**Conclusion**

Otomycosis is one of the commonest conditions encountered in a General ENT Clinic. The prevalence of otomycosis is 9 to 30% across the world. The incidence of otomycosis in our study is 14.8%. Manual workers were more commonly affected. Trauma to the ear canal while self-cleaning the ear with wooden sticks, metal wax pickers was the common predisposing factor followed by the use of antibiotic ear drops and instillation of oil into the ear. Itching was the commonest symptom of otomycosis in our series and *Aspergillus Niger* is the commonest fungi isolated followed by *Aspergillus flavus, Aspergillus Fumigatus* and *Candida albicans*. The right side was more commonly affected. Regular long term follow-up is necessary for the effective treatment of otomycosis. Patient education is important in the prevention of otomycosis.

**References**


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Acknowledgement: Nil
Table I. Distribution of otomycosis among different age and sex groups in this study

<table>
<thead>
<tr>
<th>Age Group</th>
<th>No. of patients</th>
<th>Percentage of Total patients</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Sex</td>
<td></td>
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<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>11 – 20</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>21 – 40</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>41 – 60 &amp; above</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>21</td>
</tr>
<tr>
<td>Percentage of total cases</td>
<td>59.6%</td>
<td>40.3%</td>
</tr>
</tbody>
</table>

Figure 1. Patient distribution according to presenting complaints
Table II. Distribution of predisposing factors and their incidence in this series

<table>
<thead>
<tr>
<th>Predisposing Factors</th>
<th>No. of Cases</th>
<th>Percentage of Total patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of Infection</td>
<td></td>
<td></td>
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<tr>
<td>Traumatic injury to the ear canal while self-cleaning</td>
<td>29</td>
<td>55.7%</td>
</tr>
<tr>
<td>Water entry</td>
<td>23</td>
<td>44.2%</td>
</tr>
<tr>
<td>Antibiotic ear drops</td>
<td>28</td>
<td>53.8%</td>
</tr>
<tr>
<td>Instillation of coconut oil</td>
<td>20</td>
<td>38.4%</td>
</tr>
<tr>
<td>Associated systemic diseases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>7</td>
<td>13.4%</td>
</tr>
<tr>
<td>Hypertension</td>
<td>2</td>
<td>3.8%</td>
</tr>
<tr>
<td>CSOM</td>
<td>8</td>
<td>15.3%</td>
</tr>
<tr>
<td>Wax</td>
<td>44</td>
<td>84.6%</td>
</tr>
</tbody>
</table>

Figure 2. Distribution of Fungal isolates among otomycosis patients