

MYCOLOGICAL PROFILE IN OTOMYCOSIS PATIENTS IN THE NORTH COASTAL REGION OF ANDHRA PRADESH

Swapna Lenka¹ Hanumanthu Kishore Dora², Shoba Seetharama Raju³, Srinivasa Rao Lenka⁴

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Corresponding Author:
Dr. Srinivasa Rao Lenka,
Email: drsrinivasarao34@gmail.com.

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¹Assistant Professor, Department of ENT, Government Medical College, Srikakulam, India.

²Assistant Professor, Department of ENT, Government Medical College, Srikakulam, India.

³Assistant Professor, Department of ENT, Government Medical College, Rajahmundry, India.

⁴Associate Professor, Department of General Medicine, Maharaj Institute of Medical Science, Vijayanagaram, India.

Abstract

Background: Otomycosis the fungal infection of the external auditory canal is challenging for both patients and otolaryngologists that need long-term follow-up as its recurrence rate is high. **Aim:** The study aims to identify various fungal species in otomycosis patients. **Material & Methods:** This study was a cross-sectional one conducted in the Government Medical College and Hospital, Srikakulam. Patients with otomycosis infection were included in the study. Ear swab sample was collected and cultured on Sabroud's dextrose agar, fungal growth was identified and documented. **Results:** A total of 120 patients were considered for the study out of which the majority (70) were males and less females (50). The mean age of the patients was 26 years. Otorrhea and pruritis are the most occurring symptoms. The most common fungal species identified in the study population was *Aspergillus* followed by candida. **Conclusion:** The ear infectious disease otomycosis is frequent in individuals living in humid environments. *Aspergillus fumigatus* is the most common fungal infection noted in the studied population.

INTRODUCTION

The ear gets exposed to biotic elements of the atmosphere and paves the way for the growth of bacteria and fungi which contribute to inflammation and fluid creation within the ear. Andrall and Gaverret in 1843 identified fungal ear infections for the first time.^[1]

In the middle ear, a fungal infection of the external auditory canal is commonly called otomycosis or fungal otitis externa.^[2] Ear blockage, hearing loss, itching, otalgia, and tinnitus are some of the common symptoms of otomycosis. Globally, otomycosis is more seen in tropic and subtropic environments of dusty and warm humid environments.^[3,4]

With the increased use of antibiotics and in certain immunocompromised conditions like diabetes and bad hygiene, the rise of otomycosis is seen.^[5] Bacterial infection, hearing aids with occlusive molds, open mastoid cavities, and trauma are some other factors that influence patients to have otomycosis.^[6] In rare instances, otomycosis becomes life-threatening in immune-compromised patients which leads to multiple cranial nerve palsies with increasing mortality.^[7,8] The most prevalent fungi noted in otomycosis patients were *Aspergillus niger* and *Candida* species along with other minor fungal

infections like *Mucor*, *Scopulariopsis*, *Penicillium*, and *Rhizopus*.^[9]

The treatment for otomycosis requires long-term follow-up and hence patients and otolaryngologists become frustrated. However, it is essential to treat otomycosis in immunosuppressed patients to reduce complications like hearing impairment, perforations in the tympanic membrane, and bone infection. For confirming the diagnosis, screening of fungal cultures is essential.

Hence, this study is conducted to screen the most common fungi seen in otomycosis patients in our region.

MATERIALS AND METHODS

This was a cross-sectional study performed in the Department of Otolaryngology, Government Medical College, Srikakulam from December 2021 to December 2022. Patients diagnosed with otomycosis infection were considered for the study samples. Patients with other infections were excluded from the study. Informed consent was obtained from all the patients before the start of the study.

A total of 120 patients were included in the study. The samples were procured from the infected ear by sterile cotton swab immediately after the visit and

transported to the microbiology laboratory. The swabs were inoculated using Sabouraud's dextrose agar and incubated at 37 degrees Celsius. The suspected fungal cultures were examined both macroscopically and microscopically with Lactophenol cotton blue stain (LPCB) by scotch tape.^[10]

Statistical Analysis

The data collected was entered into an Excel sheet and analyzed using SPSS 23.0 version. Descriptive statistics were performed as frequencies, percentages, mean, and standard deviation.

RESULTS

In the present study, a total of 120 patients diagnosed with otomycosis were involved. There are 70 males and 50 females representing 58% and 41 % respectively and a ratio of 1.4:1. The mean age of the participants was 26.12± 14.7. The number of cases involved were right ear infected than the left ear with an incidence of 90 (75%) and 30 (25%). The most common symptom noted in the study participants was

ear itching, hearing impairment, tinnitus, and pruritis. [Table 1]

On careful examination, the maximum number of patients had ear discharge (50%), followed by the mycotic plug (29%), mycelial mat (8%) soft debris (7%), and cotton woolly mat (5%).

The mycological profile of the collected samples showed *Aspergillus* species as the predominant fungal culture followed by others. [Table 2]

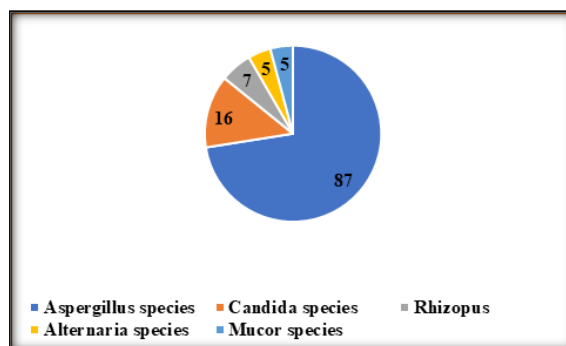


Figure 1: Distribution of fungal species in otomycosis patients

Table 1: Symptoms present in otomycosis patients

Symptoms presented	Number of individuals affected	Percentage
Ear Itching	12	10%
Hearing impairment	16	13%
Tinnitus	10	8.3%
Pruritis and otorrhea	82	68%

Table 2: Mycological profile in otomycosis patients

Name of the fungal species	Number of patients affected	Percentage
<i>Aspergillus niger</i>	18	15%
<i>Aspergillus flavus</i>	4	3.3%
<i>Aspergillus versicolor</i>	7	5%
<i>Aspergillus glaucus</i>	2	1.6%
<i>Aspergillus fumigatus</i>	56	46%
<i>Candida albicans</i>	7	5%
<i>Candida glabrata</i>	9	7.5%
Mucor species	5	4.16%
Rhizopus	7	5%
Alternaria species	5	4.16%

DISCUSSION

Otomycosis is an infective disorder of the ear that is defined as a superficial fungal infection in the external auditory canal. Our study aimed to identify different fungal species in otomycosis patients.

Though the incidence of otomycosis is not known, the fungal infections seem to be causative agents with *Aspergillus* species as the major contributor.^[11]

Studies proved that tropical and subtropical regions are more prone to this infection and it hikes to peak in the summer season. Various other factors like humidity, high temperature, and trauma are also responsible factors for otitis externa.

Literature shows that otomycosis is detected in any age group from 1 to 100 years and in our study, the age of patients was found to be 26 similar to the findings of Fasunla J et al and Ologe et al.^[4,12]

The incidence of otomycosis in these age groups is common due to factors like traveling and occupational exposure and other age groups are less exposed to these pathogens. It was also noted that males were more affected than females in the present study which is correlated with the studies of Than KM et al., Kaur R et al, and Ho T et al.^[13-15]

As per the literature, the common symptoms noted were ear discharge, hearing loss, and tinnitus which is in coordination with the present study results where ear itching is seen in 12 individuals, hearing impairment is seen in 16 individuals and tinnitus is noted in 10 individuals.^[16,17]

As per the literature, the most common fungal infections noted in otomycosis patients globally were *Aspergillus* species and *Candida* species. These were coordinated with the present study results where *Aspergillus* species are seen in 87 patients out of 120 individuals followed by candida in 16 patients that

are correlated with studies of Satish HS et al. and Paulose KO et al.^[5,18]

Most of the mycological infections result in masses of debris with hyphae and suppuration where pruritis is seen as a marked feature of this condition and ear discharge is predominantly seen.^[15] This was in coordination with the present study where pruritis is seen in 82 individuals representing 68%.

To summarize, this study highlights the identification of fungal species in otomycosis patients.

CONCLUSION

To conclude, otomycosis is a most common disease condition occurring in warm, humid environments favorable for its growth. In this study, otorrhea and pruritis are the most widespread symptoms. *Aspergillus fumigatus* is the predominant fungi seen in the study population. Identification of these fungal species at early stages delays the mortality rate in immunosuppressed patients.

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Declaration

We declare no conflicts of interest.

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