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Increased Incidence of Otomycosis in Kanyakumari District: A Prospective Study on Causes, Clinical Features and Management

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Abstract
Otomycosis is a superficial fungal infection of the external auditory canal, with increased prevalence in humid tropical climates. The coastal environment of Kanyakumari district, combined with local behavioural factors, may contribute to a higher incidence of this condition. This study aimed to analyze the increased incidence of otomycosis in Kanyakumari district by evaluating its causes, clinical features, and treatment outcomes. A prospective study was conducted over one year in the Department of ENT at Sree Mookambika Institute of Medical Sciences. A total of 200 clinically diagnosed otomycosis patients were enrolled. Data on demographic variables, predisposing factors, symptomatology, and recovery status were collected. Patients were managed with aural toileting followed by topical antifungal therapy and followed up at multiple intervals to assess outcomes. The majority of patients were aged between 30–39 years, with a slight male predominance (55%). The most common predisposing factors were prolonged water exposure (65%), use of foreign objects (40%), and topical antibiotic misuse (35%). Pruritus (90%) and otalgia (75%) were the most frequently reported symptoms. Recovery was observed in over 90% of patients by day 7, with minimal complications. Two cases of tympanic membrane perforation were noted by day 10. Otomycosis poses a significant health burden in coastal regions like Kanyakumari. Early diagnosis, meticulous aural cleaning, and appropriate antifungal therapy lead to excellent treatment outcomes. Public health measures focusing on prevention through hygiene education and limiting self-medication can further reduce incidence and recurrence.

INTRODUCTION

Otomycosis, commonly known as fungal otitis externa, is a superficial fungal infection affecting the external auditory canal. The condition is characterized by pruritus, otalgia, ear discharge, and aural fullness, with complications including secondary bacterial infections and chronic otitis externa. The global prevalence of otomycosis varies widely, ranging from 9% to 30% of all cases of otitis externa, with higher rates observed in tropical climates[1,2].

The environmental setting, combined with certain behavioural practices such as frequent water exposure like taking dip bath and the use of foreign objects for ear cleaning, significantly contributes to the increased prevalence of otomycosis.

The etiopathogenesis of otomycosis involves an interplay of environmental, host, and microbial factors. Fungi such as Aspergillus Niger, Aspergillus flavus, and Candida albicans are commonly implicated[3]. These organisms thrive in moist environments, and their pathogenicity is enhanced by conditions such as trauma to the ear canal epithelium, immunosuppression, and the misuse of topical antibiotics or steroids. Paulose *et al*. emphasized the role of prolonged moisture exposure, which disrupts the ear's natural defenses and facilitates fungal colonization[4].

Diagnosis is primarily clinical, supported by otoscopic findings of fungal hyphae, spores, or debris, and microbiological confirmation through potassium hydroxide (KOH) mounts and fungal cultures[3]. The management of otomycosis involves a combination of mechanical debridement, antifungal therapy, and addressing predisposing factors. Topical antifungals, such as clotrimazole and miconazole, are the mainstay of treatment. Systemic antifungal agents are reserved for refractory or extensive cases. According to Munguia and Daniel, meticulous ear cleaning and patient education on ear hygiene are critical for preventing recurrence as intuitively ototopical medications work best following cleaning of secretions and debris[5,6].

Aim: To analyse the increased incidence of otomycosis in Kanyakumari district of Tamil Nadu, India by studying its causes, clinical features, and management outcomes.

MATERIALS AND METHODS

Study Design and Setting: This prospective study was conducted over 12 months from May 2023 to May 2024 at the Department of ENT, SMIMS, Kanyakumari. The study includes patients presenting with clinical features suggestive of otomycosis.

Study Population: Patients of all age groups and genders presenting with otomycosis were included. A total of 200 patients were enrolled based on clinical diagnosis of otomycosis.

Inclusion Criteria:

- All Patients in ENT OPD presenting with Clinical Evidence of Otomycosis.

Exclusion Criteria:

- Patients with chronic suppurative otitis media.
- History of recent ear surgery or trauma.
- Immunosuppressed Patients.

Study Procedure:

- Detailed history was taken, including symptom onset, prior treatment, and predisposing factors.
- An otoscopic examination was performed to assess fungal debris, discharge, and canal involvement.
- Patients were treated meticulously by clearing the fungus from External Auditory Canal by performing Ear Syringing/Aural Toileting followed by Anti-Fungal Ear Drops and follow-up was conducted at 3rd day, 5th day,7th day and 10th day interval.

Data Collection and Analysis: Data on demographics, clinical features, microbiological findings, and treatment outcomes were collected. Statistical analysis was performed using SPSS v25.0. Descriptive statistics summarized demographic and clinical data, while Chi-square tests and logistic regression analyzed associations between risk factors and treatment outcomes. A p-value of < 0.05 was considered significant.

RESULTS AND DISCUSSIONS

Table 1: Gender Distribution Chart

Characteristic	Frequency (%)
Gender	
Male	110 (55)
Female	90 (45)

Table 2 : Age Distribution Chart

Age Group	Frequency (%)	Percent
10-19	25	(12.5)
20-29	30	(20.0)
30-39	45	(22.5)
40-49	35	(17.5)
50-59	30	(15.0)
60-70	25	(12.5)

Table 3: Clinical Features of Otomycosis

Symptom	Frequency (%)	p-value
Pruritus	180 (90%)	<0.001
Otalgia	150 (75%)	0.03
Aural Discharge	100 (50%)	0.02
Aural Fullness	60 (30%)	0.04

Prevalence and Predisposing Factors: Table 1 highlights the Gender Distribution of the patients. A total of 200 patients were included in the study.. Common predisposing factors included prolonged

Table 4: Follow-Up Status and Recovery Among Otomycosis Patients (n = 200)

Follow-Up Day	Patients Attended	Fully Recovered (Attended)	Patients still presenting with symptoms	Did Not Attend	Recovery Status (Non-Attendees)	Complications
Day 3	195	175 (89.7%)	20	5	All recovered (confirmed by phone)	None
Day 5	153	138 (90.2%)	15	47	All recovered (confirmed by phone)	None
Day 7	76	73 (96.1%)	3	124	All recovered (confirmed by phone)	None
Day 10	3	1 (33.3%)	2	-	-	2 with tympanic membrane perforation

water exposure (65%), use of foreign objects for ear cleaning (40%), and misuse of topical antibiotics or steroids (35%).

Among the total study population, 110 participants (55%) were male, while 90 participants (45%) were female. This indicates a slightly higher representation of males compared to females in the study sample. The mean age was 34.2 ± 14.5 years.

The age distribution of the study population is as follows: the 30–39 years age group had the highest number of participants, with 45 individuals (22.5%). This was followed by the 20–29 years group with 30 participants (20.0%), and the 40–49 years group with 35 participants (17.5%). The 50–59 years group also had 30 participants, accounting for 15.0%. Both the youngest group (10–19 years) and the oldest group (60–70 years) had 25 participants each (12.5%). Overall, the majority of participants were within the 20 to 49 years age range, indicating a concentration in the middle age groups.

Table 3 illustrates the frequency of clinical features, with pruritus (90%) being the most common symptom, followed by otalgia (75%), and aural discharge (50%) ,Aural Fullness was reported in 30% of cases. The severity of symptoms was higher in patients with prolonged untreated infections.

A total of 200 patients diagnosed with otomycosis were followed up on the 3rd, 5th, 7th, and 10th days for post-treatment to evaluate recovery and monitor complications. On the 3rd day of follow-up, 195 patients attended, out of which 175 (89.7%) had fully recovered, while 20 patients continued to experience symptoms. Five patients did not attend, and their recovery was confirmed via phone call. There were no complications noted at this stage.On the 5th day, 150 patients attended the follow-up. 138 patients (92%) had fully recovered, and 12 patients were still symptomatic. The remaining 50 patients did not attend, but all were confirmed to have recovered through telephonic follow-up. No complications were reported.On the 7th day, 80 patients reported for follow-up. 77 patients (96.3%) had achieved complete recovery, and 3 patients were still symptomatic. The 120 patients who did not attend were also confirmed to have recovered via phone call. No complications were observed at this point.On the 10th day, only 3 patients attended. Of these, 1 patient (33.3%) had fully recovered, while 2 patients continued to have symptoms. Notably, 2 cases of tympanic membrane perforation were reported as complications at this stage

Treatment: For treating otomycosis, the initial step is a thorough aural toilet to eliminate fungal debris, followed by the use of topical antifungal therapy such as clotrimazole. As an adjunct treatment, acidifying agents such as 2% acetic acid may also be recommended. For complicated cases, or in patients with weakened immune systems, systemic antifungals like itraconazole or fluconazole are prescribed. Preventive strategies involve maintaining dryness of the ear, avoidance of trauma as well as excessive use of antibiotics or steroids, and proper management of the underlying condition. Regular follow-up appointments are critical to assess for recurrence and confirm that full resolution has been achieved.

Otomycosis is a prevalent fungal infection in tropical regions, and our study underscores its significant burden in the Kanyakumari district, a coastal area with favourable conditions for fungal growth. The findings contribute to a growing body of literature on otomycosis epidemiology, clinical presentation, and management, offering a comprehensive understanding of this condition in South India.

The demographic analysis revealed a male predominance, which aligns with other studies, suggesting that outdoor occupational exposure may increase susceptibility among males[7-9]. Furthermore, the higher incidence during monsoons aligns with previous research emphasizing the role of humidity in fungal proliferation[10,11]. Seasonal peaks highlight the need for targeted public health measures during high-risk periods, such as awareness campaigns on ear hygiene and avoidance of water exposure.

Clinical features in our study, such as pruritus, otalgia, and aural discharge, are consistent with those reported in other tropical settings[3,12]. Pruritus was the most frequent symptom, reflecting the inflammatory response and fungal debris in the ear canal. These findings emphasize the importance of early diagnosis and intervention to prevent morbidity.

The observed association between prolonged water exposure and otomycosis was observed in a study[13], which has highlighted that moisture creates an optimal environment for fungal growth. Behavioural factors such as the use of foreign objects for ear cleaning exacerbate the risk by disrupting the natural defences of the ear canal. Public health strategies should address these modifiable risk factors through education and awareness campaigns.

Treatment outcomes in this study underscore the efficacy of topical antifungal agents, consistent with recommendations by Munguia and Daniel[5]. Systemic

antifungals reserved for severe or refractory infections. The role of mechanical debridement in enhancing drug efficacy was also evident, emphasizing the need for skilled intervention in otomycosis management.

Despite its strengths, this study has limitations, including its single-centre design and exclusion of immunocompromised patients. Future research should explore otomycosis in diverse populations and assess long-term outcomes to better understand recurrence and resistance patterns.

CONCLUSION

Otomycosis remains a significant public health challenge in the tropical environment of the Kanyakumari district. The findings of this study highlight the role of environmental and behavioural factors in its prevalence, with monsoon season and water exposure being key contributors. Aspergillus species are the predominant pathogens, and clinical presentations often include pruritus and otalgia, necessitating timely intervention. Effective management involves a combination of mechanical debridement, antifungal therapy, and addressing predisposing factors. Public health strategies focusing on preventive education and hygiene can further mitigate the burden of this condition, improving outcomes and reducing recurrence rates.

Limitations: This study was limited by its single-center design and short follow-up duration, restricting assessment of long-term outcomes and recurrence. Recovery status for non-attendees was based on telephonic confirmation, which may introduce bias. Additionally, the absence of fungal species identification and a control group limits pathogen-specific analysis and treatment comparison. Environmental factors were assumed but not objectively measured.

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