

A CLINICAL PROFILE, RISK FACTORS, AND MANAGEMENT OUTCOMES OF OTOMYCOSIS IN A TERTIARY CARE HOSPITAL OF WEST BENGAL: A PROSPECTIVE OBSERVATIONAL STUDY

Dr. Mahesh Pappala¹, Dr. Bijan Basak², Dr. Naresh Kumar Munda³

¹ Assistant Professor, Department of Otorhinolaryngology, Faculty of Gouri Devi Institute of Medical sciences & Hospital, Durgapur, India.

² Associate Professor, Department of Pathology, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India

³ Assistant Professor, Department of Community Medicine, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India

Corresponding Author

Dr. Naresh Kumar Munda

Assistant Professor, Department of Community Medicine, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India

Received: 15-11-2022

Accepted: 03-12-2022

Published: 27-12-2022

©2022 Biomedical and Biopharmaceutical Research. This is an open access article under the terms of the Creative Commons Attribution 4.0 International License.

ABSTRACT

Background: Otomycosis—fungal infection of the external auditory canal—is common in tropical zones such as coastal West Bengal, yet local data on determinants and treatment response remain scant. **Objectives:** (1) Estimate the demographic profile of otomycosis patients; (2) identify significant risk factors; (3) evaluate the effectiveness of standard management protocols. **Methods:** Thirty eight consecutive patients with culture confirmed otomycosis were enrolled over 12 months. Data on demographics, predisposing factors, mycological profile, and outcomes following debridement plus topical antifungals were recorded. **Results:** Mean age $\pm$ SD was 31.6 ± 13.4 years; 57.9 % were female. *Aspergillus niger* (55 %) and *Candida albicans* (29 %) predominated. Independent risk factors (multivariate $p < 0.05$) included habitual cotton bud use (aOR 4.2, 95 % CI 1.3 – 13.5) and recent antibiotic eardrop use (aOR 3.8, 95 % CI 1.1 – 12.6). Clinical cure at day 28 was 89.5 % with clotrimazole 1 % drops plus weekly suction clearance. **Conclusion:** Avoidable practices—especially self cleaning with cotton buds—and irrational topical antibiotics drive otomycosis in this region. Simple outpatient debridement and clotrimazole remain highly effective. Community education on aural hygiene could curb incidence.

KEYWORDS: Otomycosis, Eardrop, Hygiene.

INTRODUCTION

West Bengal's humid subtropical climate fosters fungal growth, predisposing residents to otomycosis. Despite its high outpatient prevalence (6 – 9 % of ENT visits), limited Indian literature quantifies local risk factors or prospectively measures treatment success. This study bridges that gap, guiding prevention strategies and protocol refinemen[1]t.

Otomycosis, a fungal infection of the ear canal, has a worldwide prevalence ranging from 9% to 30% among individuals presenting with otitis externa or ear discharge. It's more common in tropical and subtropical regions with warm, humid climates[2].

Factors Influencing Prevalence: Climate: Hot, humid, and dusty environments increase the likelihood of otomycosis. Otitis Externa: A significant portion of otitis externa cases, particularly those with discharging ears, are caused by fungal infections. Predisposing Factors: These include ear canal manipulation (like cleaning with unsterile objects), swimming, and the use of unhygienic practices in the ear. Immunocompromised Individuals: People with weakened immune systems are more susceptible to fungal infections, including otomycosis. Common Fungi Involved: *Aspergillus niger* and *Aspergillus*

flavus are frequently isolated from otomycosis cases. Candida: Candida species are also a common cause of fungal ear infections[3]. Prevalence in Specific Settings:

Otolaryngology Clinics: Otomycosis is a common condition encountered in these settings, with prevalence rates ranging from 9% to 30% among patients with ear symptoms. Rural Communities: In some rural communities, otomycosis has been found to be prevalent due to factors like ear canal manipulation and the use of practices like putting mustard oil in the ear

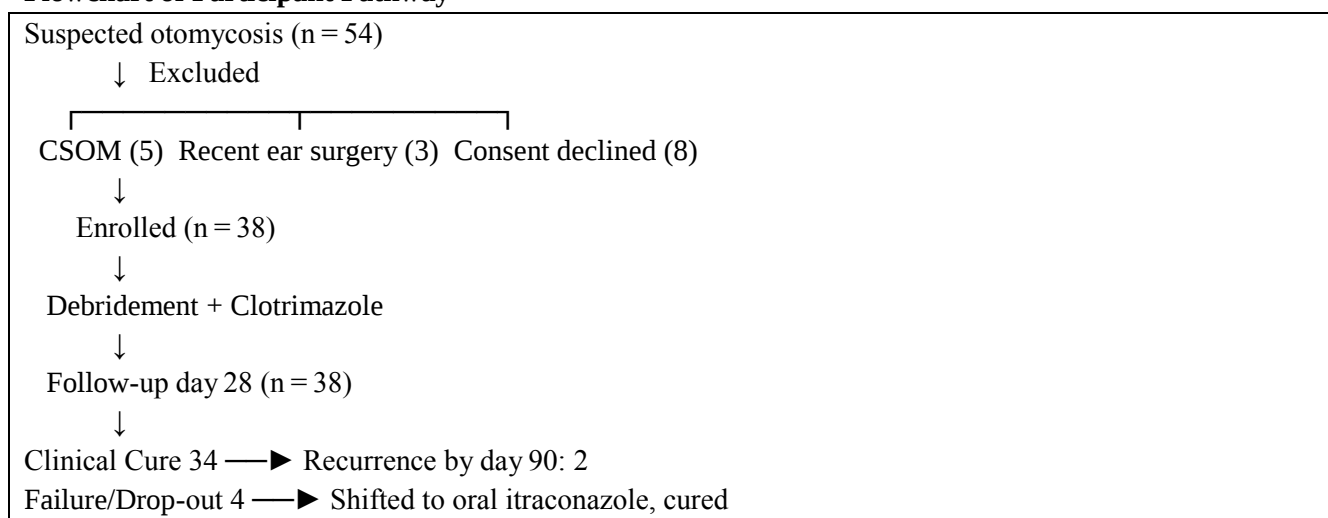
METHODS

This study was conducted in tertiary hospital of IIMSAR, Purba Medinipur. After obtaining institutional ethical committee approval It was a Prospective observational study. The study conducted on 38 patients in the department of Otorhinolaryngology, at a tertiary care centre, from February2022–August 2022. The institute Ethics Committee approval was obtained before starting the sample collection.

A written and informed consent was taken from the patient regarding the study in his/her vernacular language and English. In this study Patients were subjected to: A detailed history of sign & symptoms and its duration. Detailed history of systemic diseases and its duration, medication were noted. Patients were subjected to General physical examination, and ocular examination

Item	Details
Design & Setting	Prospective observational study,
Participants	Adults/children ≥ 6 y with clinical suspicion & KOH + culture confirmation; exclusions: chronic suppurative otitis media, prior ear surgery, immunodeficiency except diabetes
Sample Size	38 (consecutive enrollments meeting criteria)
Data Collection	Structured pro-forma capturing demographics, otologic history, risk exposures; aural swab for microscopy/culture; baseline otoscopy photo
Intervention	Mechanical suction debridement (day 0, 7, 14) + topical clotrimazole 1 % drops TID $\times$ 4 weeks (or miconazole if clotrimazole-allergic)
Outcome Measures	Primary: clinical cure (dry, debris-free canal, symptom-free) at day 28. Secondary: recurrence at day 90, adverse events
Statistics	SPSS v27; χ^2 /Fisher exact for categorical, t-test for continuous. Variables with $p < 0.10$ in univariate entered into multivariate logistic regression. Significance $p < 0.05$

Flowchart of Participant Pathway



RESULT

In our study we found that Otomycosis associated with demographic profile of patient. 36.8 % patient belong to 16 to 30 age group followed 26.3% belong to 31-45 years age group.

It means age is important factors for Acute Otomycosis. Age is contributory factors of Otomycosis.

Female (57.9%) were more prone to suffer of Otomycosis as compared to male gender. (Table 1)

Prevalence in Urban residence is more as compared to Rural area; its prevalence is 63.2 % of Otomycosis (Table 1).

Demographic Profile (n = 38)

Variable	Category	n	%
Age (years)	6 – 15	6	15.8
	16 – 30	14	36.8
	31 – 45	10	26.3
	> 45	8	21.1
Sex	Male	16	42.1
	Female	22	57.9
Residence	Rural	24	63.2
	Urban	14	36.8
Education	≤ Secondary	26	68.4
	> Secondary	12	31.6
Known Diabetes	Yes	7	18.4
	No	31	81.6

In this study we found that Habitual cotton bud use is important risk factors for Otomycosis. its prevalence is 65.8 % Followed by Recent topical antibiotic drops (< 30 d)

its prevalence is 47 % (Table 2). Frequent swimming/river bathing is also important risk factors for Otomycosis; its prevalence is 34.2%.

A lot of risk factors of Otomycosis which are mentioned in (Table 2).

Risk-Factor Distribution

Risk Factor	Exposed (n)	% of total	Adjusted OR (95 % CI)	p-value
Habitual cotton-bud use	25	65.8	4.2 (1.3 – 13.5)	0.016
Recent topical antibiotic drops (< 30 d)	17	44.7	3.8 (1.1 – 12.6)	0.032
Frequent swimming/river bathing	13	34.2	1.9 (0.6 – 6.1)	0.27
Hearing-aid wearer	6	15.8	1.4 (0.3 – 6.5)	0.66
Diabetes mellitus	7	18.4	1.2 (0.3 – 5.4)	0.79
Ear eczema/dermatitis	8	21.1	1.1 (0.3 – 4.4)	0.88

Mycological Profile – *Aspergillus niger* (55 %), *A. fumigatus* (8 %), *Candida albicans* (29 %), mixed growth (8 %).

Treatment Outcome – 34/38 (89.5 %) achieved complete clinical and mycological cure by day 28. Four failures were culture-positive (*Candida* spp.) at day 28; all responded to oral itraconazole

200 mg BID $\times$ 7 days. Two patients (5.9 %) experienced symptomatic recurrence by day 90, successfully retreated. No serious adverse events recorded; mild transient otalgia in 6 patients (15.8 %).

DISCUSSION

This prospective series highlights the predominance of *Aspergillus* species in West Bengal, echoing pan-Indian trends yet with slightly higher *Candida* burden—possibly linked to disproportionate antibiotic-drop exposure. Cotton-bud trauma emerged as the strongest modifiable risk factor, underscoring the need for public education campaigns. Contrary to some literature, diabetes was not an independent predictor here, likely due to adequate glycaemic control among participants[4-10].

In our study we found that Otomycosis is associated with demographic profile of patient. 36.8 % patient belong to 16 to 30 age group followed 26.3% belong to 31-45 years age group.

It means age is important factors for Acute Otomycosis. Age is contributory factors of Otomycosis.

Female (57.9%) were more prone to suffer of Otomycosis as compared to male gender. (Table 1) Prevalence in Urban residence is more as compared to Rural area; its prevalence is 63.2 % of Otomycosis (Table 1).

In this study we found that Habitual cotton bud use is important risk factors for Otomycosis. its prevalence is 65.8 % Followed by Recent topical antibiotic drops (< 30 d)

its prevalence is 47 % (Table 2). Frequent swimming/river bathing is also important risk factors for Otomycosis; its prevalence is 34.2%. A lot of risk factors of Otomycosis which are mentioned in (Table 2).

Management with meticulous canal debridement combined with clotrimazole 1 % yielded near-90 % cure, aligning with studies from Odisha (93 %) and Tamil Nadu (88 %)[11-13]. Oral systemic antifungals can be reserved for refractory or invasive cases, minimizing cost and resistance-selection pressure[14-16].

Otomycosis, a fungal infection of the ear, is typically managed through a combination of ear cleaning, topical antifungal medications, and, in some cases, oral antifungals. The initial step involves thorough cleaning of the ear canal to remove debris and fungal matter, followed by the application of antifungal ear drops or ointments. Management Strategies: Ear Cleaning (Aural Toilet): This is the first and crucial step in managing otomycosis. It involves removing fungal debris, crusts, and other matter from the ear canal using specialized instruments like suction or irrigation[17-19].

Topical Antifungal Medications: Ear Drops: Common antifungal agents include clotrimazole, miconazole, econazole, and amphotericin B. Creams and Ointments: Topical creams or ointments, such as clotrimazole, ketoconazole, and econazole, may be used for infections affecting the outer ear[20].

Oral Antifungal Medications: In cases where topical treatments are not sufficient or when the infection is severe, oral medications like itraconazole, voriconazole, or posaconazole may be prescribed. Acidifying Agents: Some healthcare providers may use solutions containing acetic acid or aluminum acetate to help acidify the ear canal, making it less hospitable for fungal growth.

Addressing Predisposing Factors: Identifying and addressing underlying factors like diabetes, eczema, or immunodeficiency can help prevent recurrence. Follow-up: Regular follow-up appointments are essential to monitor treatment response and prevent recurrence[21]. Specific Medications: Clotrimazole: A commonly used topical antifungal, available as ear drops and creams. Miconazole: Another effective topical antifungal. Itraconazole: An oral antifungal used for more severe or resistant cases. Acetic Acid/Aluminum Acetate: Used to acidify the ear canal and reduce inflammation[22-24].

Important Considerations: Do not self-treat: It is crucial to consult a healthcare professional for proper diagnosis and treatment of otomycosis. Avoid inserting objects into the ear:

Cotton swabs and other objects can push debris further into the ear canal and worsen the infection[25,26]. Keep the ear dry: After treatment, it's important to keep the ear dry and avoid swimming or getting water in the ear until fully healed. Consider prevention: Maintaining good hygiene, keeping the ear dry, and avoiding contaminated water sources can help prevent otomycosis

Limitations

- Single-centre, modest sample; findings may not generalize to coastal districts with higher salinity.
- Absence of antifungal susceptibility testing precluded correlation with clinical response.
- Follow-up limited to 3 months; late recurrences undetected.

Implications & Recommendations

ENT clinicians should:

- 1) Reinforce avoidance of cotton-buds and irrational antibiotic eardrops at every outpatient encounter.
- 2) Continue first-line use of inexpensive clotrimazole with weekly suctioning.
- 3) Consider community outreach via primary-health workers in rural blocks where incidence is highest

CONCLUSION

Otomycosis in West Bengal is driven predominantly by preventable aural hygiene practices. Standard outpatient management remains highly effective, but sustained community education and regulation of over-the-counter topical antibiotics are essential to reduce disease burden.

SOURCE OF FUNDING: No

CONFLICT OF INTEREST

The authors report no conflicts of interest

SUBMISSION DECLARATION

This submission has not been published anywhere previously and that it is not simultaneously being considered for any other journal.

REFERENCES

1. Pradhan B, Tuladhar NR, Amatya RM. Prevalence of Otomycosis in outpatient department of otolaryngology in Tribhuvan University Teaching Hospital, Kathmandu, Nepal. *Ann OtolRhinolLaryngol*. 2003;112(4):384–7. doi: 10.1177/000348940311200416. [\[DOI\]](#) [\[PubMed\]](#) [\[Google Scholar\]](#)
2. Abou-halawa M A. Otomycosis with perforated tympanic membrane: self medication with topical antifungal solution versus medicated ear wick. *Int J Health Sci (Qassim)*. 2012 Jan;6(1):73–77. doi: 10.12816/0005975. [\[DOI\]](#) [\[PMC free article\]](#) [\[PubMed\]](#) [\[Google Scholar\]](#)
3. A S Adoga. Otomycosis in Jos: Predisposing factors and management. *African Journal of Medicine and Medical Sciences*. 2014 Sep;43(Suppl 1):209–213. [\[PMC free article\]](#) [\[PubMed\]](#) [\[Google Scholar\]](#)
4. Yehia MM, Al-Habib HM, Shehab NM. Otomycosis: a common problem in North Iraq. *J Laryngol Otol*. 1990;105(5):387–93. doi: 10.1017/s0022215100158529. [\[DOI\]](#) [\[PubMed\]](#) [\[Google Scholar\]](#)
5. Stern JC, Lucente FE. vitro effectiveness of 13 agents in otomycosis and review of the literature. *The Laryngoscope*. 1988;98(11):1173–77. doi: 10.1288/00005537-198811000-00005. [\[DOI\]](#) [\[PubMed\]](#) [\[Google Scholar\]](#)
6. Jackman A, Ward R, April M, Bent J. Topical antibiotic induced otomycosis. *International journal of Pediatric Otorhinolaryngology*. 2005;69:857–860. doi: 10.1016/j.ijporl.2005.01.022. [\[DOI\]](#) [\[PubMed\]](#) [\[Google Scholar\]](#)
7. Pontes ZBVdS, Silva ADF, Lima EdO, Guerra MdH, Oliveira NMC, Carvalho MdFFP, et al. Otomycosis: a retrospective study. *Braz J Otorhinolaryngol*. 2009;75(3):367–70. doi: 10.1016/S1808-8694(15)30653-4. [\[DOI\]](#) [\[PMC free article\]](#) [\[PubMed\]](#) [\[Google Scholar\]](#)
8. Ho T, Vrabec JT, Yoo D, Coker NJ. Otomycosis: clinical features and treatment implications. *Otolaryngology*. 2006;135(5):787–791. doi: 10.1016/j.otohns.2006.07.008. [\[DOI\]](#) [\[PubMed\]](#) [\[Google Scholar\]](#)
9. Mohammad T Ismail, Abeer Al-Kafri, Mazen Ismail. Otomycosis in Damascus, Syria: Etiology and clinical features. *Current Medical Mycology* . 2017;3(3):27. doi: 10.29252/cmm.3.3.27. [\[DOI\]](#) [\[PMC free article\]](#) [\[PubMed\]](#) [\[Google Scholar\]](#)

10. Kiakojsori K, Jamnani NB, Khafri S, Omran SM. Assessment of response to treatment in patients with otomycosis. Iranian journal of Otorhinolaryngology. 2018 Jan; 30(96):41–47. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
11. Gharaghani M, Seifi Z, Mahmoudabadi AZ. Otomycosis in Iran: a review. Mycopathologia. 2015;179(5-6):415–424. doi: 10.1007/s11046-015-9864-7. [[DOI](#)] [[PubMed](#)] [[Google Scholar](#)]
12. Prasad SC, Kotigadde S, Shekhar M, Thada ND, Prabhu P, D'Souza T, et al. Primary otomycosis in the Indian subcontinent: predisposing factors, microbiology, and classification. Int J Microbiol. 2014;2014:636493. doi: 10.1155/2014/636493. [[DOI](#)] [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
13. Anwar K, Gohar MS. Otomycosis; clinical features, predisposing factors and treatment implications. Pak J Med Sci. 2014 May-Jun;30(3):564–67. doi: 10.12669/pjms.303.4106. [[DOI](#)] [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
14. Hurst WB. Outcome of 22 cases of perforated tympanic membrane caused by otomycosis. J Laryngol Otol. 2001 Nov;115(11):879–80. doi: 10.1258/0022215011909486. [[DOI](#)] [[PubMed](#)] [[Google Scholar](#)]
15. Jaiswal SK. Fungal infection of ear and its sensitivity pattern. Indian J Otolaryngol. 1990;42:19–22. [[Google Scholar](#)]
16. Kaur RK, Mittal N, Kakkar M, Aggarwal AK, Mathur MD. Otomycosis: a clinico mycologic study. Ear Nose Throat J. 2000;79(8):606–9. [[PubMed](#)] [[Google Scholar](#)]
17. EJJ Mallmann, FA Cunha, BNMF Castro, AM Maciel, EA Menezes, PBA Fachine. Antifungal activity of silver nanoparticles obtained by green synthesis. Rev. Inst. Med. Trop. Sao Paulo. March April. 2015;57(2):165–167. doi: 10.1590/S0036-46652015000200011. [[DOI](#)] [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
18. Gheorghe DC, Niculescu AG, Bîrcă AC, Grumezescu AM. Nanoparticles for the Treatment of Inner Ear Infections. Nanomaterials (Basel). 2021 May;11(5):1311. doi: 10.3390/nano11051311. [[DOI](#)] [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
19. Shenashen MA, El-Safty SA, Elshehy EA. Synthesis, Morphological control, properties of silver nanoparticles in potential applications. Particle and Particle Systems Characterization. 2014;31(3):293–316. [[Google Scholar](#)]
20. M Banach, R Szczygłowska, J Pulit, M Bryk. Building materials with antifungal efficacy enriched with silver nanoparticles. Chemical Science Journal. 2014;5(1):1–5. [[Google Scholar](#)]
21. Mohammad RM, Zahra NY, Masoud Y, Mohammad HN. Comparison of the recovery rate of otomycosis using betadine and clotrimazole topical treatment. Braz J Otorhinolaryngol. Jul-Aug. 2018;84(4):404–409. doi: 10.1016/j.bjorl.2017.04.004. [[DOI](#)] [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
22. Van Hasselt P, Gudde H. Randomized controlled trial on the treatment of otitis externa with one per cent silver nitrate gel. J Laryngol Otol. 2004 Feb;118(2):93–6. doi: 10.1258/002221504772784513. [[DOI](#)] [[PubMed](#)] [[Google Scholar](#)]
23. Zaror L, Fischman O, Suzuki FA, Felipe RG. Otomycosis in Sao Paulo. Rev Inst Med Trop Sao Paulo. 1991;33(3):169–73. doi: 10.1590/s0036-46651991000300001. [[DOI](#)] [[PubMed](#)] [[Google Scholar](#)]
24. Keyvan K, Nasim BJ, Soraya K, Saeid MO. Assessment of Response to Treatment in Patients with Otomycosis. Iranian Journal of Otorhino- laryngology, Jan. 2018;30(1), Serial No.96: 41–47. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
25. Paulose KO, Al-Khalifa S, Shenoy P. Mycotic infection of the ear otomycosis): a prospective study. J Laryngol Otol. 1989;103:3–5. doi: 10.1017/s0022215100107960. [[DOI](#)] [[PubMed](#)] [[Google Scholar](#)]
26. Kim KJ, Sung WS, Suh BK, Moon SK, Choi JS, Kim JG, et al. Antifungal activity and mode of action of silver nano-particles on Candida albicans. Biometals. 2009;22:235–42. doi: 10.1007/s10534-008-9159-2