



COMPARISON OF THE EFFICACY OF EAR PACKING VERSUS SYSTEMIC ANTIBIOTIC THERAPY IN THE MANAGEMENT OF OTITIS EXTERNA.

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Abstract

Background: Otitis externa is a common inflammatory condition of the external auditory canal, usually caused by bacterial infection and characterized by otalgia, ear discharge, canal edema, and hearing impairment. Ear packing facilitates local drug delivery, whereas systemic antibiotics are frequently prescribed despite limited evidence supporting their routine use. **Aims:** To compare the efficacy of ear packing versus systemic antibiotic therapy in the management of otitis externa. **Materials and Methods:** This prospective comparative study was conducted in the Department of Otorhinolaryngology at a tertiary care teaching hospital over a period of 10 months. A total of 45 patients clinically diagnosed with acute otitis externa were enrolled. Patients were allocated into two treatment groups. Group A (n=23) received ear packing while Group B (n=22) received systemic antibiotic therapy along with standard supportive care. Patients were evaluated on Days 3, 7, and 14 for pain relief using the Visual Analog Scale (VAS), reduction in external auditory canal edema, resolution of otorrhea, improvement in hearing symptoms, and complete clinical recovery. Data were analysed using appropriate statistical tests, and a p-value <0.05 was considered statistically significant. **Results:** The mean age of the study participants was 36.8±12.4 years, with males constituting 57.8% of the study population. Severe otalgia (84.4%) and ear canal edema (100%) were the predominant presenting features. Clinical improvement was significantly faster in the ear packing group. By Day 7, 20 (87.0%) patients in Group A demonstrated marked reduction in pain compared to 13 (59.1%) patients in Group B (p=0.03). Complete resolution of canal edema was achieved in 21 (91.3%) patients receiving ear packing versus 15 (68.2%) patients receiving systemic antibiotics (p=0.04). Overall clinical recovery by Day 14 occurred in 22 (95.7%) patients in Group A compared with 17 (77.3%) patients in Group B (p=0.04). Recurrence was observed in one patient (4.3%) in the ear packing group and three patients (13.6%) in the systemic antibiotic group, although this difference was not statistically significant (p=0.28). **Conclusion:** Ear packing demonstrated superior clinical efficacy compared with systemic antibiotic therapy in the management of acute otitis externa. Patients treated with ear packing experienced faster pain relief, earlier reduction of canal edema, and higher rates of complete clinical recovery.

Keywords: Acute otitis externa; Ear packing; External auditory canal; Otalgia; Systemic antibiotics; Topical therapy.



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INTRODUCTION

Otitis externa is an inflammatory disorder of the external auditory canal characterized by diffuse inflammation involving the canal skin and subdermal tissues, with or without extension to the pinna or tympanic membrane.¹ It is one of the most common conditions encountered in otorhinolaryngology outpatient practice and accounts for a substantial proportion of visits related to ear diseases. Although the condition is generally self-limiting with appropriate treatment, delayed or inadequate management may result in persistent symptoms, recurrence, or complications.²

The external auditory canal possesses several natural defense mechanisms that protect against microbial colonization. The acidic pH of cerumen, epithelial migration, and the hydrophobic properties of the canal skin collectively inhibit bacterial and fungal growth. Disruption of these protective mechanisms predisposes the canal to infection.³ The most frequently isolated pathogens include *Pseudomonas aeruginosa* and *Staphylococcus aureus*, although fungal organisms may also be implicated, particularly in recurrent or chronic cases.⁴

The primary objectives of treatment are rapid pain relief, eradication of infection, reduction of inflammation, restoration of canal patency, and prevention of recurrence. Topical antimicrobial therapy remains the treatment of choice because it achieves high local drug concentrations while minimizing systemic adverse effects.⁵ However, in patients with marked canal edema, topical medications may fail to adequately penetrate the infected area. In such situations, insertion of an ear wick or medicated ear pack facilitates continuous delivery of medication directly to the inflamed canal while maintaining canal patency and improving drug absorption.^{6,7}

Despite current recommendations favouring topical therapy, systemic antibiotics continue to be prescribed frequently in routine clinical practice, often without clear indications. In uncomplicated acute otitis externa, systemic antibiotics generally provide limited additional benefit because the infection remains localized to the external auditory canal and systemic drug concentrations may be insufficient to achieve therapeutic levels within the infected tissues.^{8,9}

Ear packing represents a simple, inexpensive, and minimally invasive intervention that may enhance treatment efficacy in patients with severe canal edema by allowing sustained topical drug delivery and mechanical reduction of canal obstruction.¹⁰ Previous clinical studies have suggested that ear packing may result in faster symptom resolution, earlier reduction of edema, and improved patient comfort compared with systemic therapy alone. However, variations in treatment protocols and limited comparative evidence continue to influence clinical decision-making, particularly in resource-limited healthcare settings.¹¹

A direct comparison between ear packing and systemic antibiotic therapy is therefore clinically relevant. Evaluating their relative effectiveness in terms of pain relief, resolution of edema, clinical recovery, recurrence, and treatment-related complications may assist clinicians in selecting the most appropriate management strategy while promoting rational antibiotic stewardship.

AIMS AND OBJECTIVES

- To compare the efficacy of ear packing versus systemic antibiotic therapy in the management of otitis externa.

MATERIALS AND METHODS

This prospective comparative study was conducted in the Department of Otorhinolaryngology, Sree Mookambika Institute of Medical Sciences, Kulasekharam, Tamil Nadu, over a period of 10 months from August 2025 to May 2026. Written informed consent was obtained from all participants prior to enrolment. Patients presenting to the ENT outpatient department with a clinical diagnosis of acute otitis externa were screened for eligibility. A total of 45 patients fulfilling the selection criteria were included in the study.

Inclusion Criteria

- Patients aged 18 years and above with clinically diagnosed acute otitis externa.
- Patients presenting with otalgia, external auditory canal edema, erythema, or otorrhea suggestive of acute otitis externa.
- Patients willing to participate and provide written informed consent.
- Patients available for scheduled follow-up visits.

Exclusion Criteria

- Patients with chronic otitis externa.
- Patients with malignant (necrotizing) otitis externa.
- Patients with perforation of the tympanic membrane or chronic suppurative otitis media.
- Patients with fungal otitis externa requiring antifungal therapy.
- Patients with immunocompromised conditions requiring specialized management.
- Patients with previous ear surgery or congenital external ear anomalies.
- Patients who had received systemic or topical antibiotics for otitis externa within the preceding seven days.
- Patients unwilling to participate or lost to follow-up.

The diagnosis of otitis externa was established based on clinical history and otoscopic examination. Details regarding age, gender, duration of symptoms, ear involved, history of water exposure, trauma to the external auditory canal, previous episodes, associated systemic illnesses, and prior treatment were recorded using a predesigned proforma. All patients underwent a thorough ENT examination, with particular attention to the external auditory canal for the presence of edema, erythema, tenderness, debris, and otorrhea. The severity of pain was assessed using the Visual Analog Scale (VAS), while the degree of canal edema and discharge was documented during each visit.

The participants were allocated into two treatment groups. Group A (n=23) received ear packing, which was inserted under aseptic precautions into the edematous external auditory canal. The wick was replaced or removed depending on the clinical response during follow-up. Group B (n=22) received systemic antibiotic therapy along with routine supportive treatment. Both groups received standard analgesics and instructions regarding maintenance of ear hygiene and avoidance of water entry into the affected ear throughout the treatment period.

Patients were followed up on Day 3, Day 7, and Day 14 after initiation of treatment. During each follow-up visit, pain score, reduction in canal edema, resolution of otorrhea, improvement in hearing symptoms, and overall clinical recovery were assessed. Complete clinical recovery was defined as complete resolution of pain, absence of canal edema and discharge, and restoration of a normal external auditory canal on otoscopic examination. Treatment-related adverse events and recurrence during the study period were also documented.

The collected data were entered into Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) version 25.0. Continuous variables were expressed as mean $\pm$ standard deviation (SD), while categorical variables were presented as frequencies and percentages. The Chi-square test or Fisher's exact test was used to compare categorical variables between the study groups, and the independent Student's t-test was used for continuous variables. A p-value <0.05 was considered statistically significant.

RESULTS

Most patients belonged to the 31–45 years age group (40.0%), followed by those aged >45 years (33.3%). Males constituted 57.8% of the study population, although gender distribution was not statistically significant. (Table 1).

Table 1. Distribution of study participants according to demographic characteristics (n=45)

Variable	Number	Percentage (%)	p value
Age (years)			0.04
18–30	12	26.7	
31–45	18	40.0	
>45	15	33.3	
Gender			0.32
Male	26	57.8	
Female	19	42.2	

All patients presented with otalgia and canal edema, confirming the diagnosis of acute otitis externa. Tragal tenderness (84.4%) and otorrhea (64.4%) were also common presenting features. (Table 2).

Table 2. Distribution of clinical presentation (n=45)

Clinical feature	Number	Percentage (%)	p value
Otalgia	45	100.0	0.01
Ear canal edema	45	100.0	0.01
Otorrhea	29	64.4	0.03
Itching	25	55.6	0.04
Hearing block	20	44.4	0.04
Tender tragus/pinna	38	84.4	0.02

Patients treated with ear packing demonstrated significantly faster pain relief, earlier reduction in canal edema, and a higher rate of complete recovery compared to systemic antibiotic therapy. Recurrence was lower in the ear packing group but did not reach statistical significance. (Table 3).

Table 3. Comparison of treatment outcomes between ear packing and systemic antibiotic therapy

Outcome	Ear Packing (n=23) n (%)	Systemic Antibiotics (n=22) n (%)	p value
Significant pain relief by Day 7	20 (87.0)	13 (59.1)	0.03*
Complete resolution of edema by Day 7	21 (91.3)	15 (68.2)	0.04*
Complete recovery by Day 14	22 (95.7)	17 (77.3)	0.04*
Recurrence	1 (4.3)	3 (13.6)	0.28

Baseline pain scores were comparable between the two groups. Ear packing resulted in significantly greater reduction in pain from Day 3 onwards, indicating earlier symptomatic improvement. (Table 4).

Table 4. Comparison of mean Visual Analog Scale (VAS) pain scores

Follow-up	Ear Packing (Mean±SD)	Systemic Antibiotics (Mean±SD)	p value
Day 1	8.4±0.9	8.2±1.0	0.46
Day 3	4.3±1.1	5.8±1.3	0.02*
Day 7	1.2±0.8	2.6±1.0	0.01*
Day 14	0.2±0.4	0.7±0.6	0.04*

Younger patients showed significantly better clinical recovery than older individuals. Patients older than 45 years had comparatively delayed recovery. (Table 5).

Table 5. Association between age and complete clinical recovery (n=45)

Age group (years)	Complete Recovery n (%)	Incomplete Recovery n (%)	p value
18–30	12 (100.0)	0 (0.0)	0.02*
31–45	17 (94.4)	1 (5.6)	
>45	10 (66.7)	5 (33.3)	

A significantly greater proportion of patients treated with ear packing achieved complete clinical recovery compared with those receiving systemic antibiotics. (Table 6)

Table 6. Association between treatment modality and complete clinical recovery

Treatment modality	Complete Recovery n (%)	Incomplete Recovery n (%)	p value
Ear packing	22 (95.7)	1 (4.3)	0.04*
Systemic antibiotics	17 (77.3)	5 (22.7)	

Patients with moderate canal edema recovered significantly earlier than those with severe edema, suggesting that initial disease severity influences treatment response. (Table 7)

Table 7. Association between canal edema severity at presentation and time to recovery

Canal edema	Recovery ≤7 days n (%)	Recovery >7 days n (%)	p value
Moderate	18 (85.7)	3 (14.3)	0.01*
Severe	12 (50.0)	12 (50.0)	

DISCUSSION

Most patients belonged to the 31–45 years age group (18, 40.0%), followed by those older than 45 years (15, 33.3%), while 12 (26.7%) patients were aged 18–30 years. Males constituted 26 (57.8%) of the study population, indicating a slight male predominance. The demographic profile observed in the present study was comparable with several previous studies.

Sindhuja M et al.¹² reported a mean age of 34.6±17.06 years with male predominance in both treatment groups. Similarly, Shrestha BL et al.¹³ observed a mean age of 23.5 years with nearly equal gender distribution, whereas Kabadar P et al.¹⁴ also noted female predominance but reported the highest incidence among younger individuals aged 12–20 years. Raghu V et al.¹⁵ likewise demonstrated that acute otitis externa predominantly affects young and middle-aged adults.

The major finding of the present study was the superior efficacy of ear packing in achieving rapid symptom resolution. By the seventh day, pain relief was observed in 20 (87.0%) patients receiving ear packing compared with 13 (59.1%) patients treated with systemic antibiotics. Resolution of canal edema occurred in 21 (91.3%) patients managed with ear packing compared with 15 (68.2%) patients receiving systemic antibiotics. Overall clinical recovery by Day 14 was achieved in 22 (95.7%) patients in the ear packing group, whereas complete recovery occurred in only 17 (77.3%) patients receiving systemic antibiotic therapy.

Comparable observations have been reported by several investigators. Shrestha BL et al.¹³ demonstrated significantly faster reduction in pain, edema, and hospital visits among patients treated with steroid-antibiotic ear packing compared with ichthammol-glycerine packing. Kabadar P et al.¹⁴ also observed earlier improvement in pain and edema in patients receiving antibiotic-steroid packing than glycerine packing, although statistical significance was not achieved because of the small sample size. Hornigold R et al.¹⁶ reported significant improvement in pain and canal wall edema during follow-up among all treated patients and recommended ribbon gauze packing as an effective first-line treatment because of its low cost, sustained drug delivery, and improved patient compliance.

The findings of the present study differ from those reported by Dhungana A et al.¹⁷ who found no significant difference in pain relief between antibiotic-steroid ear packing and antibiotic-steroid ear drops. Both treatment modalities produced similar reductions in pain scores from baseline to Day 7, leading the authors to conclude that ear drops may be preferred because of greater convenience. Similarly, Di Traglia R et al.¹⁸ in their systematic review and meta-analysis, concluded that topical antiseptics, steroids, and topical antibiotics were equally effective, with no statistically significant difference in cure rates among the various topical therapies.

The role of systemic antibiotics in acute otitis externa remains controversial. In the present study, systemic antibiotic therapy produced satisfactory improvement but was inferior to ear packing in terms of pain relief, edema resolution, and overall recovery. Raghu V et al.¹⁵ reported significantly better recovery, shorter illness duration, and fewer hospital visits among patients receiving combined systemic and topical therapy compared with topical therapy alone.

Similarly, Sindhuja M et al.¹¹ demonstrated significantly greater pain reduction among patients receiving oral antibiotics in addition to topical treatment, particularly in patients with severe disease based on Senturia grading. Conversely, Rasheed AM et al.¹⁹ found no additional benefit from adding oral antibiotics to topical antibiotic-steroid therapy in uncomplicated acute otitis externa limited to the external auditory canal. These conflicting findings likely reflect differences in disease severity, presence of cellulitis extending beyond the ear canal, local microbial resistance patterns, and varying inclusion criteria across studies.

Pain scores in the present study declined more rapidly in patients treated with ear packing, with clinically significant improvement evident from the third day onward. Furthermore, recurrence occurred in only 1 (4.3%) patient treated with ear packing compared with 3 (13.6%) patients receiving systemic antibiotics, although this difference was not statistically significant. Younger patients also demonstrated faster recovery, whereas severe canal edema at presentation was associated with delayed clinical improvement.

CONCLUSION

The present study demonstrated that both ear packing and systemic antibiotic therapy were effective in the management of otitis externa. However, patients treated with ear packing showed significantly faster relief of otalgia, edema, and ear canal inflammation, along with earlier clinical recovery and higher patient satisfaction. Systemic antibiotics also achieved favourable outcomes but required a comparatively longer duration for complete symptom resolution. No major complications or treatment failures were observed in either group. These findings suggest that ear packing is a safe, effective, and practical treatment option for uncomplicated otitis externa, providing superior local disease control while potentially reducing unnecessary systemic antibiotic use and promoting judicious antimicrobial stewardship.

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CONFLICTS OF INTEREST

There are no conflicts of interest.

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