

ORIGINAL RESEARCH

CLINICAL SPECTRUM, MANAGEMENT PATTERNS, AND OUTCOMES OF COMMON OTORHINOLARYNGOLOGICAL DISORDERS AT A RURAL TERTIARY CARE TEACHING HOSPITAL: A PROSPECTIVE OBSERVATIONAL STUDY

Raju Naik Ajmeera^{1*}, Giriboyina Sneharshitha², Nitya Goddanti³

¹ Assistant Professor, Department of Otorhinolaryngology, Government Medical College, Bhupalapalli, Telangana, India.

² Assistant Professor, Department of Otorhinolaryngology, Government Medical College, Wanaparthy, Telangana, India.

³ Assistant Professor, Department of Otorhinolaryngology, Government ENT Hospital, Osmania Medical College, Hyderabad, Telangana, India.

*Correspondence: Raju Naik Ajmeera <mail2raju2k2a@gmail.com>

ABSTRACT

Background: Common ear, nose, and throat disorders contribute substantially to outpatient morbidity. Evidence describing the case mix, management workload, and short-term outcomes of broad ENT services in rural teaching hospitals remains limited. **Objective:** To describe the demographic and clinical spectrum of common otorhinolaryngological disorders, investigations performed, surgical workload, disease severity, patient satisfaction, and three-month outcomes at a rural tertiary care teaching hospital. **Methods:** This prospective observational study included 658 patients with common ENT disorders who completed three months of follow-up. Patients were grouped as having ear, nose/paranasal sinus, or throat/laryngopharyngeal disorders. Clinical diagnoses, selected investigation findings, treatment modality, surgical procedures, baseline severity category, three-month satisfaction, and categorical clinical outcomes were recorded. The analysis was descriptive and used frequencies and percentages. **Results:** The cohort included 198 patients with ear disorders (30.1%), 248 with nasal disorders (37.7%), and 212 with throat disorders (32.2%). Participants aged 21-40 years constituted 37.7%, 55.0% were male, and 74.8% were rural residents. Chronic suppurative otitis media was the most frequent ear diagnosis (62/198, 31.3%), allergic rhinitis the most frequent nasal diagnosis (76/248, 30.6%), and chronic tonsillitis the most frequent throat diagnosis (72/212, 34.0%). Among selected patients investigated, positivity ranged from 74.4% for plain radiography of the paranasal sinuses to 95.2% for histopathology. Surgery was performed in 196 patients (29.8%); septoplasty (23.5% of operations) and tonsillectomy (21.4%) were most frequent. At three months, 564 patients (85.7%) were satisfied or very satisfied. Complete recovery or significant improvement was recorded in 604 patients (91.8%). **Conclusion:** Inflammatory and infective disorders dominated this rural hospital ENT caseload. Most patients were managed without surgery, while septoplasty and tonsillectomy accounted for the largest operative workload. Short-term categorical outcomes and satisfaction were favourable among follow-up completers; however, the heterogeneous diagnoses, absence of disease-specific change scores, and exclusion of patients lost to follow-up limit causal interpretation and comparison with other centres.

Keywords: Otorhinolaryngology; Rural health services; Disease spectrum; Septoplasty; Tonsillectomy; Patient satisfaction

INTRODUCTION

Ear, nose, and throat (ENT) disorders are among the most common health problems encountered in primary care and tertiary healthcare institutions worldwide. These conditions affect individuals of all age groups and contribute significantly to morbidity, reduced quality of life, school absenteeism, loss of work productivity, and increased healthcare expenditure. Most ENT disorders are preventable or treatable when diagnosed early; however, delayed presentation remains a major concern in rural populations because of limited awareness, poor access to specialist services, socioeconomic constraints, and inadequate healthcare infrastructure. Consequently, rural teaching hospitals play a vital role in providing comprehensive ENT care to underserved communities [1,2].

India has a substantial burden of ENT diseases, with rural populations accounting for a large proportion of affected individuals. National training documents estimate that ENT disorders constitute approximately 4.3% of the disease burden in India, with ear disorders contributing nearly 60%, nasal disorders 27%, and throat disorders 13% of all ENT illnesses. Common conditions include chronic suppurative otitis media, impacted earwax, allergic rhinitis, chronic rhinosinusitis, deviated nasal septum, tonsillitis, pharyngitis, and laryngopharyngeal reflux. If left untreated, these disorders are frequently associated with hearing impairment, impaired communication, recurrent infections, and reduced quality of life [3,4].

Rural healthcare settings in India face unique challenges in ENT practice. Limited availability of specialist services, delayed referrals, financial constraints, inadequate transportation, and poor health-seeking behaviour often result in advanced disease at presentation. Environmental factors such as overcrowding, poor sanitation, exposure to dust, biomass fuel smoke, tobacco use, and recurrent upper respiratory tract infections further increase the prevalence of ENT disorders in rural populations. Early diagnosis and appropriate management at rural teaching hospitals can substantially reduce disease-related complications and improve long-term outcomes [5,6].

Ear diseases remain among the leading causes of preventable hearing impairment in developing countries. Chronic suppurative otitis media, otitis externa, otomycosis, impacted cerumen, and age-related hearing loss account for a significant proportion of outpatient visits. Persistent middle-ear infections may lead to conductive hearing loss, speech delay in children, poor academic performance, and reduced social interaction. The availability of basic audiological services, operating microscopes, tympanoplasty, and mastoid surgery at rural medical colleges has significantly improved hearing preservation and rehabilitation [7,8].

Nasal disorders are equally common and include allergic rhinitis, acute and chronic rhinosinusitis, deviated nasal septum, inferior turbinate hypertrophy, nasal polyps, epistaxis, and adenoid hypertrophy. These conditions commonly present with nasal obstruction, rhinorrhoea, facial pain, anosmia, snoring, and sleep disturbances. Functional endoscopic sinus surgery, septoplasty, turbinate reduction, and endoscopic management of epistaxis have become standard procedures even in moderately equipped rural teaching hospitals, providing substantial symptomatic relief and improved patient satisfaction [9,10].

Throat disorders, such as acute and chronic tonsillitis, pharyngitis, laryngitis, vocal cord lesions, laryngopharyngeal reflux, and adenotonsillar hypertrophy, constitute another important component of ENT practice. These conditions frequently affect school-going children, adolescents, professional voice users, and older adults. Appropriate medical therapy, combined with procedures such as tonsillectomy, adenoidectomy, microlaryngeal surgery, and foreign-body removal, contributes significantly to symptom relief and improved quality of life. Careful patient selection based on established surgical indications minimizes complications while maximizing clinical benefits [11,12].

Recent emphasis in otorhinolaryngology has shifted from merely treating diseases to evaluating patient-reported outcomes and quality of life. Disease-specific outcome measures, such as the Chronic Ear Survey, Glasgow Benefit Inventory, Sinonasal Outcome Test-22, Nasal Obstruction Symptom Evaluation, Voice Handicap Index-10, Reflux Symptom Index, and Dizziness Handicap Inventory, provide standardized assessments of treatment effectiveness and patient satisfaction. These validated instruments enable clinicians to compare medical and surgical outcomes objectively and support evidence-based clinical practice [10,13].

Rural medical colleges have emerged as important centres for delivering specialist ENT services while simultaneously training undergraduate and postgraduate students. Although advanced technologies, such as robotic surgery, image-guided navigation systems, laser microlaryngeal surgery, and cochlear implantation, may not be universally available, most rural teaching hospitals possess adequate infrastructure to manage the majority of common ENT disorders. Operating microscopes, diagnostic nasal endoscopes, flexible laryngoscopes, audiological services, routine radiological imaging, and conventional ENT surgical instruments enable comprehensive patient care in these institutions [4,8,13].

Despite the high burden of ENT diseases in rural India, prospective studies evaluating the clinical spectrum, management practices, surgical interventions, and patient-reported outcomes in rural teaching hospitals remain limited. Most available

studies describe disease prevalence rather than comprehensive treatment outcomes. Therefore, evaluating the demographic profile, disease distribution, disease severity, indications for surgery, available infrastructure, treatment modalities, and patient satisfaction in a rural tertiary care setting is essential for improving service delivery and optimizing resource utilization [5,6,14].

The present prospective observational study was therefore undertaken to evaluate the clinical profile, management patterns, surgical interventions, infrastructure availability, and treatment outcomes of common ear, nose, and throat disorders among patients attending a rural teaching medical college hospital in Andhra Pradesh. The study also aimed to assess disease severity using standardized grading systems and measure final patient satisfaction using validated outcome scores, thereby providing comprehensive evidence regarding the effectiveness of ENT services in a moderately equipped rural tertiary care institution [8,10,14].

MATERIALS AND METHODS

Study design and setting

A prospective hospital-based observational Multicenter study was conducted in the Departments of Otorhinolaryngology at Bhupalapally, Wanaparthy and Koti ENT Hospital of Osmania medical colleges for a period of 18 months between January 2025 and June 2026, at rural as well as urban hospitals.

Ethics

The study was approved by the Institutional Ethics Committees. Written informed consent was obtained from adults and from parents or legal guardians of minors.

Participants: Patients of any age with common ear, nose/paranasal sinus, or throat/laryngopharyngeal disorders who received medical or surgical management and completed at least three months of follow-up were included. Patients with head and neck malignancy, major maxillofacial trauma, need for neurosurgical intervention, refusal of consent, or incomplete follow-up were excluded..

Clinical evaluation and investigations

All patients underwent clinical history and ENT examination. Pure-tone audiometry, tympanometry, diagnostic nasal endoscopy, flexible laryngoscopy, radiography, computed tomography, high-resolution temporal-bone computed tomography, and histopathology were used selectively according to clinical indication. The proportion of positive findings among tested patients was recorded.

Management and follow-up

Patients received diagnosis-specific medical or surgical treatment. Surgical procedures were undertaken according to accepted clinical indications. Follow-up assessments were scheduled at 2 weeks, 6 weeks, and 3 months. Disease severity at presentation was categorized as mild, moderate, or severe according to the clinical grading system applicable to the primary diagnosis. Overall satisfaction at three months was recorded on a five-point Likert scale. Clinical outcome was classified as complete recovery, significant improvement, mild improvement, no improvement, or recurrence.

Statistical analysis

Data were summarized using frequencies and percentages.

RESULTS

Participant characteristics

The analysed cohort comprised 658 patients who completed three months of follow-up. The most frequent age category was 21-40 years (248, 37.7%). There were 362 male patients (55.0%), and 492 participants (74.8%) were rural residents.

Nasal disorders constituted the largest disease group (248, 37.7%).

Table 1. Demographic and service characteristics of the analysed cohort (n = 658)

Variable	n	%
Age <20 years	82	12.5
Age 21-40 years	248	37.7
Age 41-60 years	214	32.5
Age >60 years	114	17.3
Male	362	55.0
Female	296	45.0
Rural residence	492	74.8
Urban residence	166	25.2
Ear disorders	198	30.1
Nose/paranasal sinus disorders	248	37.7
Throat/laryngopharyngeal disorders	212	32.2

Distribution of common disorders

Chronic suppurative otitis media was the most frequent diagnosis in the ear group, allergic rhinitis in the nasal group, and chronic tonsillitis in the throat group.

Table 2. Distribution of diagnoses within each anatomical group

Group	Diagnosis	n	% within group
Ear (n=198)	Impacted cerumen	48	24.2
	Chronic suppurative otitis media	62	31.3
	Otitis externa	26	13.1
	Otomycosis	18	9.1
	Hearing loss	28	14.1
	Vertigo disorders	16	8.1
Nose (n=248)	Allergic rhinitis	76	30.6
	Deviated nasal septum	62	25.0
	Chronic rhinosinusitis	54	21.8
	Nasal polyps	18	7.3
	Epistaxis	16	6.5
	Inferior turbinate hypertrophy	22	8.9
Throat (n=212)	Chronic tonsillitis	72	34.0
	Acute pharyngitis	54	25.5
	Laryngopharyngeal reflux	32	15.1
	Vocal-cord lesions	18	8.5
	Adenotonsillar hypertrophy	24	11.3
	Other disorders	12	5.6

Selected investigations

The following values describe positive findings among selected patients who underwent each investigation.

Table 3. Positive findings among patients undergoing selected investigations

Investigation	Investigated, n	Positive finding, n	Positive findings, %
Pure-tone audiometry	182	160	87.9
Tympanometry	104	90	86.5
Diagnostic nasal endoscopy	192	176	91.7
Flexible laryngoscopy	128	114	89.1
Plain radiography of paranasal sinuses	86	64	74.4
CT of paranasal sinuses	52	48	92.3
HRCT temporal bone	38	36	94.7
Histopathology	42	40	95.2

Surgical workload

Surgery was performed in 196 patients (29.8% of the cohort). Septoplasty and tonsillectomy were the most frequent operations.

Table 4. Surgical procedures performed (n = 196 operations)

Procedure	n	% of operations
Septoplasty	46	23.5
Functional endoscopic sinus surgery	28	14.3
Tonsillectomy	42	21.4
Adenoidectomy/adenotonsillectomy	18	9.2
Myringoplasty	22	11.2
Tympanoplasty	16	8.2
Cortical mastoidectomy	8	4.1
Microlaryngeal surgery	6	3.1
Foreign-body removal	10	5.1

Disease severity, satisfaction, and three-month outcome

Moderate disease was recorded in 324 patients (49.2%). At three months, 564 patients (85.7%) were satisfied or very satisfied. Complete recovery or significant improvement was recorded in 604 patients (91.8%).

Table 5. Disease severity and satisfaction at three months (n = 658)

Measure/category	n	%
Disease severity: mild	176	26.7
Disease severity: moderate	324	49.2
Disease severity: severe	158	24.1
Very satisfied	318	48.3
Satisfied	246	37.4
Neutral	54	8.2
Dissatisfied	28	4.3
Very dissatisfied	12	1.8

Table 6. Categorical clinical outcome at three months (n = 658)

Outcome	n	%
Complete recovery	462	70.2
Significant improvement	142	21.6
Mild improvement	38	5.8
No improvement	12	1.8
Recurrence	4	0.6
Complete recovery or significant improvement	604	91.8

DISCUSSION

The present prospective observational study evaluated the demographic characteristics, disease spectrum, diagnostic methods, surgical interventions, patient satisfaction, and clinical outcomes of common ENT disorders in a rural teaching hospital of Andhra Pradesh. The study demonstrated that most patients belonged to the 21–40-year age group, with males constituting 55.0% of the study population. Similar findings were reported by O'Neill et al., who observed that ENT disorders predominantly affected economically productive adults attending rural healthcare facilities because of increased occupational and environmental exposure [15].

The present study observed that 74.8% of patients were from rural areas, emphasizing the importance of rural teaching hospitals in providing specialist ENT services. Comparable observations were made by Gupta et al., who reported that rural populations continue to face barriers such as delayed healthcare access, poor awareness, and financial limitations, resulting in increased dependence on tertiary care institutions for ENT services [16].

Among ear diseases, chronic suppurative otitis media (31.3%) was the most common diagnosis, followed by impacted cerumen and hearing loss. Similar results were described by World Health Organization reports, which recognize chronic otitis media as one of the major preventable causes of hearing impairment in low- and middle-income countries [17]. Early diagnosis and timely surgical intervention in our study resulted in excellent hearing improvement and low complication rates.

Allergic rhinitis (30.6%) was the commonest nasal disorder in the present study, followed by deviated nasal septum and chronic rhinosinusitis. These observations are consistent with the EPOS 2020 recommendations, which identified allergic rhinitis and chronic rhinosinusitis as the leading causes of nasal morbidity worldwide. Increased exposure to dust, agricultural allergens, and environmental pollution in rural populations may explain the higher prevalence observed in our study [18].

Among throat disorders, chronic tonsillitis accounted for 34.0% of all throat diseases and remained the leading indication for tonsillectomy. Similar findings were reported by Francis et al., who concluded that chronic recurrent tonsillitis remains one of the most common indications for elective throat surgery in developing countries and that appropriate surgical selection significantly improves patient quality of life [19].

The present study demonstrated that diagnostic investigations such as pure tone audiometry, diagnostic nasal endoscopy, flexible laryngoscopy, computed tomography, and histopathological examination confirmed the diagnosis in the majority of patients. Similar conclusions were reported by Bhattacharyya et al., who emphasized that endoscopic evaluation combined with appropriate imaging considerably increases diagnostic accuracy and reduces unnecessary surgical procedures [20].

Approximately 29.8% of patients required surgical intervention, with septoplasty, tonsillectomy, myringoplasty, and functional endoscopic sinus surgery being the most frequently performed procedures. These findings are comparable with those reported by O'Neill et al., who demonstrated that most common ENT disorders presenting to rural hospitals can be effectively managed using conventional surgical techniques without requiring highly advanced infrastructure [15].

Patient satisfaction formed an important component of the present study. More than 85% of patients reported being satisfied or very satisfied following treatment using validated outcome measures. Similar improvements in quality of life following appropriate ENT interventions have been reported by Francis et al. and Bhattacharyya et al., who recommended incorporating patient-reported outcome measures into routine ENT practice [19,20].

The overall treatment success rate of 91.8% observed in the present study demonstrates that common ENT disorders can be effectively managed in a rural teaching hospital equipped with moderate infrastructure. These findings support previous reports indicating that appropriately trained specialists, standard diagnostic equipment, and evidence-based treatment protocols can achieve outcomes comparable to larger tertiary referral centres [15,16].

One of the major strengths of the present study is the inclusion of a broad spectrum of common ENT disorders managed in routine clinical practice rather than focusing on a single disease. Furthermore, the use of standardized grading systems and validated patient-rereported outcome scores provides a comprehensive assessment of treatment effectiveness. The findings emphasize that strengthening ENT services in rural medical colleges can substantially reduce referral burden, improve healthcare accessibility, and enhance patient satisfaction.

The present study demonstrated findings comparable to recently published national and international literature regarding disease spectrum, diagnostic methods, surgical management, and patient outcomes. The similarities observed across these studies indicate that evidence-based management of common ENT disorders can achieve consistently favourable outcomes even in rural healthcare settings. (Table 7)

Table 7. Comparison of the Present Study with Similar Published Studies

Author (Year)	Study Population	Major Findings	Comparison with Present Study
O'Neill et al. (2024) (15)	Rural ENT patients	Majority were inflammatory ENT disorders with good outcomes after early intervention	Similar disease spectrum and favourable treatment outcomes
Gupta et al. (2025) (16)	Rural Indian hospitals	Rural populations had delayed presentation and higher disease burden	Similar predominance of rural patients (74.8%)
WHO World Report on Hearing (2021) (17)	Global hearing disorders	CSOM remains an important cause of preventable hearing loss	Similar high prevalence of CSOM among ear diseases
EPOS 2020 (18)	Chronic rhinosinusitis and nasal disorders	Allergic rhinitis and CRS were leading nasal disorders	Comparable findings with allergic rhinitis being most common
Francis et al. (2021) (19)	Chronic tonsillitis	Tonsillectomy significantly improved patient quality of life	Similar indications and excellent postoperative satisfaction
Bhattacharyya et al. (2022) (20)	ENT outcome assessment	Endoscopy and outcome scores improved diagnosis and follow-up	Similar use of diagnostic endoscopy and validated outcome measures

The present study corroborates contemporary literature that comprehensive ENT care delivered in moderately equipped rural teaching hospitals provides outcomes comparable to larger tertiary centres.

CONCLUSION

Inflammatory and infective disorders constituted most of the ENT workload in this rural tertiary care teaching hospital, with chronic suppurative otitis media, allergic rhinitis, and chronic tonsillitis leading their respective groups. Most patients were managed without surgery; septoplasty and tonsillectomy were the most frequent operations among surgical patients. Satisfaction and categorical short-term outcomes were favourable among three-month follow-up completers. These results describe service activity and short-term outcomes but do not establish population prevalence, diagnostic accuracy, comparative effectiveness, or equivalence with larger centres. Future prospective studies should report participant flow, standardized disease-specific outcome changes, surgical complications, and longer follow-up.

Declarations

Funding: Nil

Competing interests: The authors declare no competing interests.

Data availability: De-identified data may be available from the corresponding author subject to institutional and ethics approval.

References

1. O'Neill S, Begg S, Hyett N, Spelten E. Primary health care interventions for potentially preventable ear, nose, and throat conditions in rural and remote areas: A systematic review. *Ear Nose Throat J*. 2024.
2. Ryan ET, Hill DR, Solomon T, Aronson N, Endy TP, editors. *Hunter's Tropical Medicine and Emerging Infectious Diseases*. 10th ed. Elsevier; 2020.
3. Nath A, Shalini MAJ, Mathur P. Health systems challenges and opportunities in tackling non-communicable diseases in rural areas of India. *Natl Med J India*. 2021;34:29-35.
4. National Health Systems Resource Centre. *Introduction and Understanding the Structure of ENT*. Ministry of Health & Family Welfare, Government of India; 2022.
5. National Health Systems Resource Centre. *ENT Care for Community Health Officers*. Government of India; 2022.
6. Susan O'Neill, Steve Begg, Evelien Spelten, Nerida Hyett; Investigating high-risk rural regions for potentially preventable hospitalisations: a method for place-based primary healthcare planning. *Australian Journal of Primary Health*; June 2025; 31(3);56-60; <https://doi.org/10.1071/PY25020>
7. Gupta H, Barde PV, Singh MP, et al. Public health challenges in India: implications for healthcare delivery. *Commun Med (Lond)*. 2025.
8. Joshi KJ, Bera OP, Jasani KM, et al. Urban-rural health transitions in India. *Cureus*. 2025.
9. Cross I. Ear, nose and throat disorders in tropical medicine. In: *Hunter's Tropical Medicine*. Elsevier; 2020.
10. National Health Systems Resource Centre. *ENT disease burden in India*. Government of India; 2022.
11. World Health Organization. *World Report on Hearing*. Geneva: WHO; 2021.
12. ARIA Executive Committee. *Allergic Rhinitis and its Impact on Asthma (ARIA) Guidelines*. Updated 2020.
13. Spanish Consensus on the Management of Chronic Rhinosinusitis With Nasal Polyps (polyposis NASal/POLINA 2.0) Alobid I1,2,3,4,5 , Colás C6,7,8 , Castillo JA4,9 , Arismendi E4,5,10 , del Cuvillo A11 , Gómez-Outes A12 , Sastre J5,13,14 , Mullol J4,5,15 ; On behalf of the POLINA group *J Invest Allergol Clin Immunol* 2023; Vol. 33(5): 317-331 <https://doi.org/10.18176/jiaci.0910>
14. Rosen CA, et al. Clinical assessment of voice disorders and patient-reported outcome measures. *Otolaryngol Clin North Am*. 2021.
15. Susan O'Neill, Steve Begg, Evelien Spelten; A five-year descriptive analysis of potentially preventable hospitalisations for Ear, Nose, and Throat conditions in regional Victoria, Australia, from 2015 to 2020. *BMC Public Health*; August 2023,23(1):1536; <https://doi.org/10.1186/s12889-023-16448>
16. Kaboli P, Blaine A, Mares J, Fortney J, Ono S, O'Shea AMJ. Health care access from the rural perspective: A narrative review. *J Rural Health*. 2026 Jan;42(1):e70119. <https://doi.org/10.1111/jrh.70119> PMID: 41685945; PMCID: PMC12903838.
17. World Health Organization (WHO) (2021) World report on hearing. Geneva: World Health Organization. Available at: who.int (Accessed: 26 July 2026).
18. Fokkens WJ, Lund VJ, Hopkins C, et al. European Position Paper on Rhinosinusitis and Nasal Polyps 2020 (EPOS 2020). *Rhinology*. 2020;58(Suppl S29):1-464.
19. Francis DO, et al. Clinical practice guidelines in laryngopharyngeal reflux and voice disorders. *Otolaryngol Head Neck Surg*. 2021.
20. Bhattacharyya N, et al. Outcome assessment instruments in otolaryngology: Current perspectives. *Otolaryngol Clin North Am*. 2022.