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Original Research Article

Spectrum of Otorhinolaryngological Disorders in Children: A Cross-Sectional Study

Chakravarthula Madhumitha[1], Chakravarthula Ramanachary[2], Dweethi Jayaprakash[3]

[1]Senior Resident, Department of ENT, Government Medical College, Karimnagar, Telangana
[2]Professor and HOD, Department of ENT, Prathima Institute of medical sciences, Karimnagar, Telangana
[3]Associate Professor, Department of ENT, Government medical College, Nirmal, Telangana

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Corresponding Author: Dr. Dweethi Jayaprakash
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Abstract:

Background: Otorhinolaryngological disorders are among the most frequent health problems encountered in the pediatric population and contribute substantially to morbidity and healthcare utilization. The pattern and relative frequency of these conditions vary with age and environmental influences. The present study was conducted to evaluate the spectrum and distribution of ENT disorders among children attending a tertiary care hospital.

Material and Methods: This descriptive cross-sectional study included 410 children aged ≤14 years presenting to the Department of Otorhinolaryngology over an 18-month period. Demographic details, clinical features, and final diagnoses were recorded using a structured proforma. Patients were categorized into otological, rhinological, and laryngological disorders based on clinical evaluation and relevant investigations. Data were analyzed using appropriate descriptive and inferential statistical methods, with $p < 0.05$ considered statistically significant.

Results: The mean age of participants was 8.1 ± 3.9 years. The majority belonged to the 5–9-year age group (38.0%), followed by 10–14 years (35.7%) and 0–4 years (26.3%). Males constituted 57.1% of cases. Otological disorders were most common (44.4%), followed by rhinological (33.9%) and laryngological conditions (21.7%). Acute otitis media (26.4%) was the leading otological diagnosis, allergic rhinitis (31.7%) predominated among rhinological disorders, and acute tonsillitis (32.6%) was most frequent in the laryngological group. Age-wise variation in the distribution of major disorder categories was statistically significant ($p < 0.05$).

Conclusion: Pediatric ENT disorders are highly prevalent, with infective and allergic conditions forming the bulk of cases. Age-specific trends underline the importance of early detection and timely intervention to minimize complications and long-term morbidity.

Keywords: Pediatric ENT disorders, Otitis media, Allergic rhinitis, Tonsillitis, Cross-sectional study, Tertiary care hospital.

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Introduction

Otorhinolaryngological (ENT) disorders represent a significant proportion of childhood morbidities worldwide and are among the most frequent causes of outpatient and emergency department visits in the pediatric age group [1]. The unique anatomical and immunological characteristics of children predispose them to a wide array of ENT conditions, including infectious, allergic, and obstructive pathologies that can impact hearing, speech development, sleep quality, and overall quality of life [1,2]. Among these, middle ear infections such as acute otitis media and otitis media with effusion are consistently reported as leading causes of pediatric ENT consultations, with significant implications for hearing and language acquisition if not diagnosed and managed timely [3].

In addition to otological conditions, rhinological issues such as allergic rhinitis and adenoid hypertrophy are highly prevalent in children and have been associated with nasal obstruction, recurrent sinus problems, and sleep-disordered breathing [4,5]. Allergic rhinitis alone has been noted to affect a considerable proportion of children, with a prevalence that continues to rise globally due to environmental and lifestyle factors [5]. Throat-related pathologies, including acute and chronic tonsillitis, also contribute substantially to the pediatric ENT burden and frequently result in recurrent healthcare visits and antibiotic exposure [1,6].

Epidemiological studies from tertiary care settings in South Asia have demonstrated consistent patterns

of pediatric ENT disorders, with otological problems often predominating, followed by rhinological and laryngological conditions [2,3]. However, the relative distribution of these disorders can vary with demographic and regional influences, underscoring the need for localized studies to inform healthcare planning and resource allocation [3].

Given the clinical significance and varied spectrum of pediatric ENT disorders, the present study was undertaken to delineate the distribution and frequency of these conditions among children attending a tertiary care center, with the aim of enhancing understanding of their epidemiology in the regional context.

Material and Methods

Study Design and Setting: This hospital-based, descriptive cross-sectional study was conducted in a tertiary care teaching hospital in India. The objective was to evaluate the clinical spectrum and distribution pattern of otorhinolaryngological disorders among pediatric patients presenting to the outpatient and inpatient services.

Study Population: Children aged 0–14 years who attended the Otorhinolaryngology outpatient department (OPD) or were admitted to the inpatient ward during the study period were eligible for inclusion.

Inclusion Criteria

- Children aged ≤14 years.
- Patients presenting with primary otological, rhinological, or laryngological complaints.
- Caregivers willing to provide informed consent.

Exclusion Criteria

- Children with major craniofacial malformations or syndromic anomalies affecting the ear, nose, or throat.
- Patients with incomplete clinical records.
- Children who had received definitive surgical treatment for the same complaint at another institution prior to presentation.

Sample Size Determination: The required sample size was calculated using the formula for estimation of a single population proportion in cross-sectional studies: $n=Z^2\times p\times q/d^2$

Where:

- n = required sample size
- Z = standard normal deviate corresponding to 95% confidence level (1.96)
- p = anticipated prevalence of the most common pediatric ENT disorder
- q = 1 – p
- d = absolute precision

Based on previously published Indian hospital-based studies reporting that otological disorders constitute approximately 40% of pediatric ENT presentations, the anticipated prevalence (p) was taken as 0.40. Assuming a precision of 5% and 95% confidence level, the calculated minimum sample size was 369. After accounting for a 10% margin for incomplete data, the final sample size was rounded to 410 participants. All eligible consecutive patients during the study period were enrolled until the desired sample size was achieved.

Data Collection Procedure: After obtaining informed consent from parents or legal guardians, detailed demographic and clinical information was recorded in a structured case record form. The following data were collected:

- Age and sex
- Presenting complaints and duration
- Relevant medical and surgical history
- Socioeconomic background
- Clinical examination findings
- Final diagnosis

Each child underwent a comprehensive ENT examination, including:

- Otoscopic examination
- Anterior rhinoscopy
- Oropharyngeal examination
- Indirect laryngoscopy (where age-appropriate)

Ancillary investigations such as pure tone audiometry, impedance audiometry, radiological imaging, nasal endoscopy, or laboratory investigations were performed when clinically indicated. Diagnoses were categorized into otological, rhinological, and laryngological disorders based on clinical and investigative findings.

Operational Definitions:

- **Otological disorders** included conditions involving the external ear, middle ear, and inner ear.
- **Rhinological disorders** comprised diseases affecting the nasal cavity and paranasal sinuses.
- **Laryngological disorders** included pathologies of the larynx, pharynx, and related upper airway structures.

Outcome Measures: The primary outcome was the frequency distribution of various ENT disorders among children. Secondary outcomes included age-wise and gender-wise distribution patterns and the relative predominance of otological, rhinological, and laryngological conditions.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 26.0. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. Associations between categorical variables were

evaluated using the Chi-square test. A p-value <0.05 was considered statistically significant.

Results

A total of 410 pediatric patients were included in the present study. The age of the participants ranged from infancy to 14 years, with a mean age of 8.1 ± 3.9 years. The highest proportion of cases was observed in the 5–9-year age group (38.0%), followed by 10–14 years (35.7%) and 0–4 years (26.3%). Male children constituted 57.1% of the study population, while females accounted for 42.9%, indicating a male predominance (Table 1).

With respect to the category of disorders, otological conditions were the most frequently encountered, comprising 44.4% of cases. Rhinological disorders accounted for 33.9%, whereas laryngological disorders constituted 21.7% of the total study population (Table 2).

Among otological conditions (n = 182), acute otitis media was the most common diagnosis (26.4%), followed by otitis media with effusion (22.5%) and chronic suppurative otitis media (19.8%). Impacted cerumen was identified in 15.9% of cases, while otitis externa accounted for 9.9%. Congenital ear anomalies and sensorineural hearing loss were relatively less frequent, representing 3.3% and 2.2% of otological cases, respectively (Table 3).

In the rhinological category (n = 139), allergic rhinitis emerged as the leading diagnosis (31.7%). Adenoid hypertrophy was observed in 23.7% of cases, followed by acute rhinosinusitis in 19.4%. Deviated nasal septum was present in 10.8% of children. Epistaxis and nasal foreign bodies accounted for 7.9% and 4.3% of cases, respectively, while nasal polyps were documented in 2.2% of patients (Table 4).

Regarding laryngological disorders (n = 89), acute tonsillitis was the most frequently reported condition (32.6%), followed by chronic tonsillitis (23.6%) and pharyngitis (19.1%). Laryngitis constituted 11.2% of cases. Foreign body in the throat was observed in 7.9%, whereas vocal nodules and non-congenital stridor were comparatively uncommon, representing 3.4% and 2.2%, respectively (Table 5).

Age-wise analysis revealed variation in the distribution of major disorder categories. In the 0–4-year age group, otological disorders were predominant (31.9%), whereas rhinological and laryngological conditions accounted for 20.9% and 23.6%, respectively. Among children aged 5–9 years, rhinological disorders were slightly more common (39.6%), followed by otological (38.5%) and laryngological conditions (34.8%). In the 10–14-year group, laryngological disorders showed relatively higher representation (41.6%), with rhinological and otological conditions contributing 39.6% and 29.6%, respectively. The variation in distribution across age groups was found to be statistically significant ($p < 0.05$) (Table 6).

Table 1: Age and Gender Distribution of Study Participants (n = 410)

Variable	Frequency (n)	Percentage (%)
Age Group (years)		
0–4	108	26.3
5–9	156	38.0
10–14	146	35.7
Gender		
Male	234	57.1
Female	176	42.9

Mean age: 8.1 ± 3.9 years

Table 2: Category-wise Distribution of Otorhinolaryngological Disorders (n = 410)

Category	Frequency (n)	Percentage (%)
Otological disorders	182	44.4
Rhinological disorders	139	33.9
Laryngological disorders	89	21.7
Total	**410**	**100**

Table 3: Spectrum of Otological Disorders (n = 182)

Diagnosis	Frequency (n)	Percentage (%)
Acute otitis media	48	26.4
Otitis media with effusion	41	22.5
Chronic suppurative otitis media	36	19.8
Impacted cerumen	29	15.9
Otitis externa	18	9.9
Congenital ear anomalies	6	3.3
Sensorineural hearing loss	4	2.2
Total	**182**	**100**

Table 4: Spectrum of Rhinological Disorders (n = 139)

Diagnosis	Frequency (n)	Percentage (%)
Allergic rhinitis	44	31.7
Adenoid hypertrophy	33	23.7
Acute rhinosinusitis	27	19.4
Deviated nasal septum	15	10.8
Epistaxis	11	7.9
Foreign body in nose	6	4.3
Nasal polyps	3	2.2
Total	**139**	**100**

Table 5: Spectrum of Laryngological Disorders (n = 89)

Diagnosis	Frequency (n)	Percentage (%)
Acute tonsillitis	29	32.6
Chronic tonsillitis	21	23.6
Pharyngitis	17	19.1
Laryngitis	10	11.2
Foreign body throat	7	7.9
Vocal nodules	3	3.4
Stridor (non-congenital)	2	2.2
Total	**89**	**100**

Table 6: Age-wise Distribution of Major Disorder Categories

Age Group (years)	Otological n (%)	Rhinological n (%)	Laryngological n (%)	Total
0–4	58 (31.9)	29 (20.9)	21 (23.6)	108
5–9	70 (38.5)	55 (39.6)	31 (34.8)	156
10–14	54 (29.6)	55 (39.6)	37 (41.6)	146
Total	**182**	**139**	**89**	**410**

(Chi-square test; $p < 0.05$)

Discussion

In this cross-sectional study of 410 pediatric patients, otological disorders were identified as the most common category of ENT conditions, aligning with previous hospital-based reports from India and neighboring regions that consistently demonstrate a predominance of ear diseases in children presenting to ENT services [7]. The relative high frequency of otological complaints, including acute and chronic middle ear disease, may be attributed to factors such as recurrent upper respiratory infections, eustachian tube dysfunction, and delayed healthcare access common in pediatric populations [7,8].

Rhinological disorders, particularly allergic rhinitis and adenoid hypertrophy, constituted a substantial proportion of cases in the present cohort. These findings are consistent with hospital-based studies reporting significant representation of nasal and nasopharyngeal conditions among children, especially in outpatient settings [8]. Adenoid hypertrophy can contribute to nasal obstruction and is frequently associated with recurrent otitis media and nasal symptoms in childhood, underscoring its clinical relevance in pediatric ENT practice [9]. In addition, recent evidence suggests that allergic rhinitis in children not only contributes to nasal symptoms but is also associated with increased severity of tonsillar and adenoidal hypertrophy, further extending its role in upper airway morbidity [10].

Laryngological conditions, such as tonsillitis and pharyngitis, also represented a notable proportion of cases. While few large epidemiological studies focus specifically on laryngeal pathology in general ENT cohorts, specialized investigations have demonstrated that voice disorders, laryngeal reflux, and structural abnormalities are important contributors to pediatric laryngeal morbidity, particularly in tertiary care referral populations [11,12].

The observed age-related variation in disorder distribution, with otological conditions more common in younger age groups and predisposition of rhinological and laryngological conditions in older children, mirrors patterns reported in regional pediatric ENT studies, indicating that anatomical development, immune maturation, and exposure patterns influence disease prevalence across the pediatric age spectrum [7,8].

Overall, the findings of this study are consistent with the published pediatric ENT literature and reinforce the substantial contribution of otological, rhinological, and laryngological conditions to the clinical workload in tertiary care settings. The data emphasize the need for early recognition, context-

appropriate diagnostic strategies, and integrated management protocols to address the diverse spectrum of pediatric ENT disorders effectively.

Conclusion

The present study demonstrates that otorhinolaryngological disorders constitute a substantial clinical burden among children attending a tertiary care center, with otological conditions being the most prevalent, followed by rhinological and laryngological disorders. Acute and infective pathologies, particularly otitis media and tonsillitis, accounted for a considerable proportion of cases, while allergic rhinitis emerged as the leading nasal disorder. The distribution of disease categories varied significantly across different age groups, highlighting age-related patterns in clinical presentation. These findings emphasize the need for early identification, targeted preventive strategies, and timely management of common pediatric ENT conditions to reduce morbidity and improve overall child health outcomes.

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