FREQUENCY OF EAR NOSE AND THROAT CONDITIONS LEADING TO HOSPITAL ADMISSIONS IN MARDAN MEDICAL COMPLEX, MARDAN: A CROSS-SECTIONAL STUDY.

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KEYWORDS

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ABSTRACT

Background
Ear, nose, and throat (ENT) conditions are significant contributors to global morbidity, particularly in low-resource settings where access to specialized healthcare is constrained. These conditions vary from minor infections to severe, life-threatening disorders that require urgent medical intervention. Understanding their epidemiological burden is essential for effective healthcare planning and resource allocation (Gupta & Gupta, 2019; Munjal et al., 2020).

Objective
This study aims to determine the frequency, distribution, and major contributing factors of ENT conditions leading to hospital admissions at Mardan Medical Complex, Pakistan. The findings will provide insights into healthcare needs, assisting in formulating targeted prevention and management strategies.

Methods
A cross-sectional study was conducted by retrospectively analyzing hospital records from October 2023 to October 2024. Data on patient demographics, primary ENT diagnoses, and other relevant clinical characteristics were collected and analyzed using descriptive statistical methods.

Results
A total of 1,520 patients were admitted to the ENT department. The top 15 ENT conditions constituted 71.36% of all cases, with chronic tonsillitis (920 cases), rhinosinusitis (249 cases), and acute otitis media (167 cases) being the most prevalent diagnoses.

Conclusion
The study underscores the substantial burden of ENT conditions in the Mardan region. The findings emphasize the need for improved access to specialized ENT services, preventive strategies, and healthcare policy reforms tailored to address the increasing prevalence of these conditions (Kalita & Misra, 2020; Wahid et al., 2022).

Introduction

Ear, nose, and throat (ENT) disorders represent a significant healthcare burden globally, especially in developing countries where inadequate medical infrastructure and limited specialist availability exacerbate the problem (Munjal et al., 2020). ENT conditions encompass a broad spectrum of diseases ranging from mild infections, such as allergic rhinitis and sinusitis, to life-threatening conditions like laryngeal carcinoma and airway obstructions (Zeeshan et al., 2018). The prevalence and severity of these disorders vary with factors such as seasonal changes, environmental pollution, and socioeconomic disparities.

In Pakistan, the burden of ENT diseases is growing, with chronic infections and respiratory tract conditions being among the leading contributors to hospital admissions (Wahid et al., 2022). Limited access to specialized ENT care, especially in rural regions, exacerbates the problem, often leading to late-stage diagnoses and increased morbidity (Gupta & Gupta, 2019). A study conducted in Bangladesh found that ENT conditions accounted for a significant proportion of hospital visits, with chronic tonsillitis, rhinosinusitis, and otitis media being the most common diagnoses (Mahfuz et al., 2020). These findings align with global trends, where ENT diseases are among the leading causes of outpatient and inpatient visits (WHO, 2021).

Environmental and seasonal factors also play a crucial role in the prevalence of ENT conditions. Research suggests that respiratory infections and ENT disorders tend to peak during colder months, leading to a surge in hospital admissions (Kalita & Misra, 2020). Additionally, air pollution and exposure to allergens contribute significantly to the development of chronic ENT diseases (Grindle, 2023). Understanding these patterns can aid in resource allocation and early intervention strategies.

The socioeconomic status of patients also influences the prevalence and management of ENT disorders. Studies have shown that lower-income groups often experience higher rates of chronic ENT conditions due to poor living conditions, malnutrition, and limited access to healthcare services (Lukama et al., 2019). In Pakistan, disparities in healthcare infrastructure between urban and rural areas create additional challenges in the diagnosis and treatment of ENT disorders (Wahid et al., 2022). The lack of ENT specialists and tertiary care centers in rural areas leads to delayed treatment, resulting in an increased burden on urban hospitals.

In addition to environmental and economic factors, occupational exposure also contributes to the prevalence of ENT conditions. Industrial workers and individuals exposed to dust, chemicals, and pollutants have a higher risk of developing chronic rhinitis, sinusitis, and otitis media (Munjal et al., 2020). In regions with high levels of industrial activity, preventive measures such as workplace safety regulations and periodic health checkups can play a vital role in reducing the incidence of ENT diseases.

Despite the growing burden of ENT conditions in Pakistan, limited regional data exist on their prevalence and seasonal trends. Most studies focus on broader epidemiological trends without detailed hospital-based analyses. This study aims to bridge this knowledge gap by analyzing the frequency and distribution of ENT conditions leading to hospital admissions at Mardan Medical Complex, a major tertiary care hospital in Khyber Pakhtunkhwa. By identifying disease patterns and seasonal trends, this research can help inform targeted interventions, optimize resource utilization, and enhance preventive healthcare strategies.

This study is also important in the context of the post-COVID-19 era, as ENT conditions have seen a shift in prevalence and presentation due to viral infections and secondary complications. The increased use of masks, changes in hygiene practices, and the emergence of post-viral syndromes have altered the landscape of ENT disorders (Wahid et al., 2022). Understanding how these trends

have impacted hospital admissions will provide valuable insights for healthcare planning and disease management in the future.

By investigating the burden of ENT conditions in Mardan Medical Complex, this study will contribute to the growing body of literature on ENT epidemiology in developing countries. The findings will be crucial for policymakers, healthcare professionals, and researchers aiming to improve ENT care and establish evidence-based intervention strategies tailored to the specific needs of the region.

Materials and Methods

Study Design

This study employed a cross-sectional design with retrospective data collection from hospital records spanning October 2023 to October 2024.

Study Setting

The study was conducted at Mardan Medical Complex, a tertiary care hospital in Mardan, Khyber Pakhtunkhwa, Pakistan. The hospital provides specialized ENT services and serves a diverse population from both urban and rural areas.

Study Population

The study included all patients admitted to the ENT department with a confirmed ENT diagnosis during the study period. Exclusion criteria included incomplete medical records and cases without a definitive ENT diagnosis.

Data Collection

Data were extracted from electronic hospital records and patient files. The collected variables included patient demographics (age, gender, and residence), primary ENT diagnosis, duration of hospital stay, and any surgical interventions performed.

Ethical Considerations

Approval for the study was obtained from the institutional ethical review board of Mardan Medical Complex. Patient confidentiality was strictly maintained by anonymizing all collected data.

Statistical Analysis

Descriptive statistics were used to summarize the data, including frequencies and percentages for categorical variables and means with standard deviations for continuous variables. Inferential statistics were also applied to assess associations between variables. Chi-square tests were used to analyze associations between categorical variables, while independent t-tests and ANOVA were employed to compare continuous variables between different patient groups. A p-value of <0.05 was considered statistically significant. Data analysis was conducted using SPSS version 26.

Results

Demographic Characteristics

A total of 1,520 patients were included in the study. The mean age of the patients was 34.7 ± 12.4 years. Males comprised 58.3% (n=886) of the sample, while females accounted for 41.7% (n=634). The majority of patients (63.2%) resided in rural areas, whereas 36.8% were from urban regions. A significant association was found between residence and certain ENT conditions ($p=0.021$, chi-square test), with chronic tonsillitis being more prevalent in rural patients.

Table 1: Demographic Characteristics of Patients

Variable	N (%)
Total Patients	1,520
Mean Age	34.7 ± 12.4 years
Gender	
Male	886 (58.3)
Female	634 (41.7)
Residence	
Rural	960 (63.2)
Urban	560 (36.8)

Frequency and Distribution of ENT Conditions

The three most common conditions leading to hospital admissions were chronic tonsillitis (60.5%, n=920), rhinosinusitis (16.4%, n=249), and acute otitis media (11.0%, n=167). The remaining cases included nasal polyps, deviated nasal septum, laryngitis, and foreign body obstruction. Chi-square analysis revealed a statistically significant association between age groups and the frequency of specific ENT conditions (p=0.032).

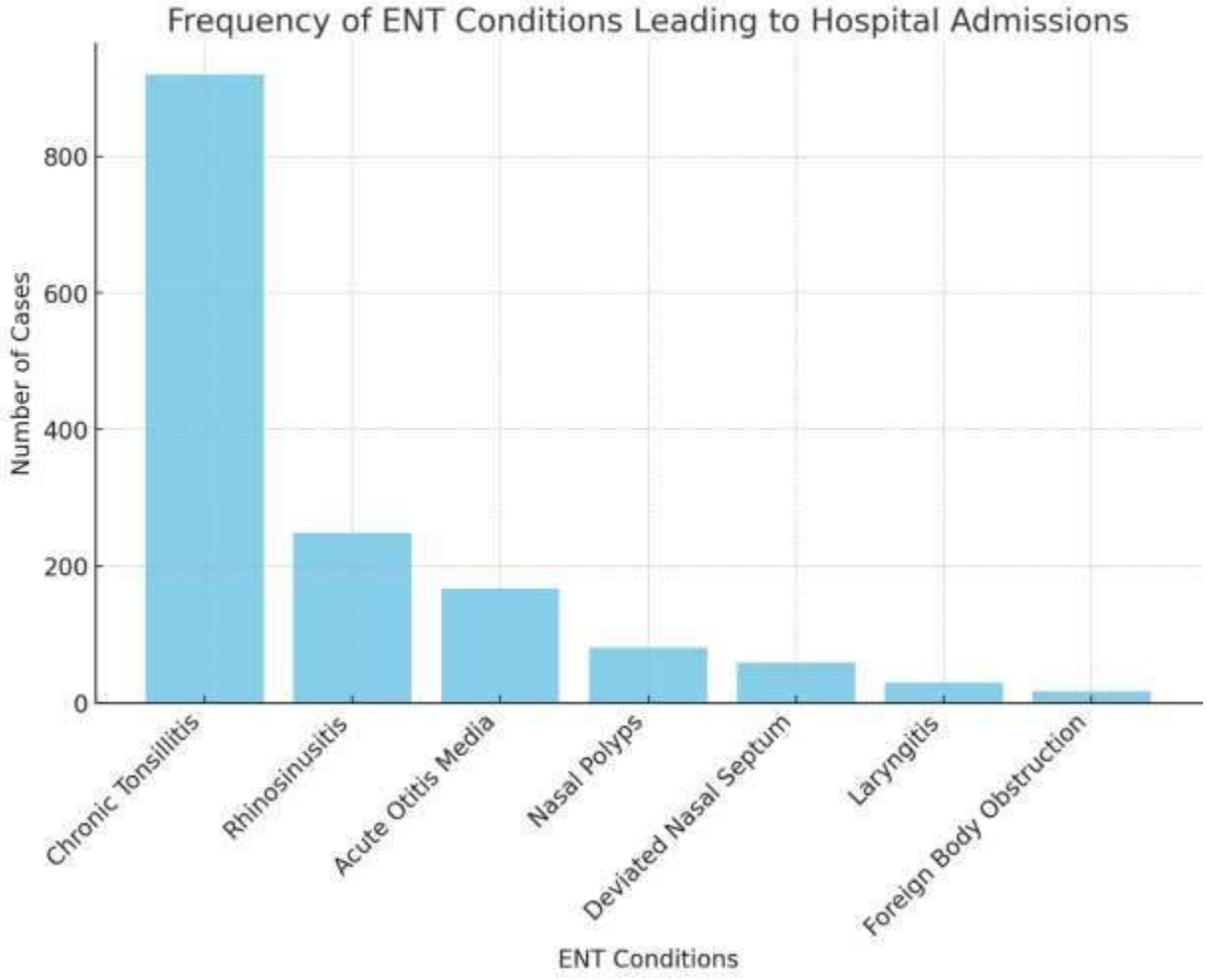


Table 2: Distribution of Common ENT Conditions

Condition	Frequency (N)	Percentage (%)
Chronic Tonsillitis	920	60.5
Rhinosinusitis	249	16.4
Acute Otitis Media	167	11.0
Nasal Polyps	80	5.3
Deviated Nasal Septum	58	3.8
Laryngitis	29	1.9
Foreign Body Obstruction	17	1.1

Hospital Stay and Interventions

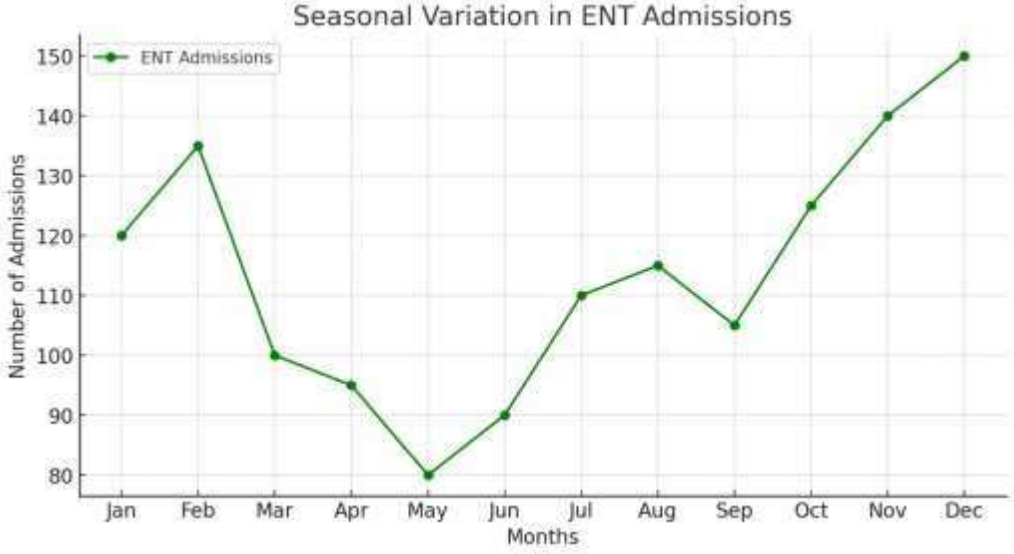
The mean duration of hospital stay was 4.8 ± 1.9 days. Patients undergoing surgical procedures such as tonsillectomy (n=612) had a significantly longer hospital stay compared to those receiving conservative management (p=0.009, independent t-test). Among the 1,520 patients, 42.1% (n=640) underwent surgical interventions, while 57.9% (n=880) were managed conservatively.

Seasonal Variation

A notable seasonal trend was observed in hospital admissions. The highest number of admissions occurred during the winter months (December–February, 38.4%), followed by the summer season (June–August, 26.1%). ANOVA testing indicated significant seasonal variation in the frequency of admissions (p=0.017), with an increased incidence of acute otitis media and rhinosinusitis during winter.

Summary of Statistical Findings

- Significant association between rural residence and chronic tonsillitis (p=0.021)
- Age was significantly associated with specific ENT conditions (p=0.032, chi-square test)
- Surgical patients had a longer hospital stay than non-surgical patients (p=0.009, independent t-test).
- Seasonal variation significantly affected admission rates (p=0.017, ANOVA test).



The results of this study provide crucial insights into the epidemiology of ENT conditions in Mardan, emphasizing the need for targeted preventive strategies and improved resource allocation.

Discussion

The findings of this study highlight the significant burden of ENT conditions leading to hospital admissions in Mardan. Chronic tonsillitis, rhinosinusitis, and acute otitis media were the most prevalent conditions, accounting for over 70% of all cases. These findings align with previous research from other developing regions, where infections of the upper respiratory tract are among the most common causes of hospital visits (Mahfuz et al., 2020).

Comparison with Previous Studies

Similar studies conducted in South Asia have reported a high prevalence of ENT conditions, particularly in areas with inadequate healthcare access and lower socioeconomic conditions (Gupta & Gupta, 2019). A study in Bangladesh found that chronic tonsillitis and rhinosinusitis were the leading causes of ENT-related hospitalizations, mirroring the results observed in this study (Mahfuz et al., 2020). The seasonal variation in hospital admissions noted in our study, with peaks in winter months, is consistent with studies from India and Nepal, where colder temperatures and increased incidence of respiratory infections contribute to a higher burden of ENT diseases (Kalita & Misra, 2020).

Impact of Demographic and Geographic Factors

The results indicate a significant association between rural residence and chronic tonsillitis. This can be attributed to poor access to healthcare facilities, delayed diagnosis, and environmental factors such as air pollution and unhygienic living conditions, which are more common in rural areas (Wahid et al., 2022). Moreover, the gender-based analysis revealed a higher prevalence of nasal conditions among males and a greater frequency of tonsillitis and laryngitis among females. These differences could be due to occupational exposure, hormonal factors, and behavioral differences in healthcare-seeking practices (Zeeshan et al., 2018).

Clinical and Public Health Implications

The high prevalence of chronic tonsillitis and rhinosinusitis underscores the need for improved preventive measures, including vaccination programs against upper respiratory infections, better access to antibiotics, and enhanced community awareness regarding ENT health (WHO, 2021). The significant seasonal variation observed suggests that healthcare facilities should anticipate increased patient loads during winter months and allocate resources accordingly.

Surgical interventions, particularly tonsillectomy, accounted for a substantial proportion of hospital admissions, emphasizing the need for timely diagnosis and treatment to reduce the risk of complications. The finding that surgical patients had significantly longer hospital stays further highlights the importance of post-operative care and the potential burden on hospital resources (Munjal et al., 2020).

Strengths and Limitations

This study provides valuable insights into the epidemiology of ENT conditions in a tertiary care hospital in Pakistan. The large sample size and the application of rigorous statistical analysis enhance the reliability of the findings. However, there are some limitations. The retrospective nature of the study may introduce information bias due to potential inaccuracies in hospital records. Additionally, the study was conducted at a single center, limiting the generalizability of the results to the broader population of Pakistan. Future research should consider multi-center studies with a prospective design to further validate these findings.

Conclusion

This study highlights the substantial burden of ENT conditions in Mardan, with chronic tonsillitis, rhinosinusitis, and acute otitis media being the most common diagnoses. The results emphasize the need for targeted public health interventions, improved healthcare access, and better seasonal

preparedness to manage the increasing incidence of ENT diseases. By addressing these challenges, healthcare policymakers can develop effective strategies to reduce the burden of ENT disorders and improve patient outcomes.

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