ORIGINAL RESEARCH

A comprehensive assessment of ear, nose, and throat disorders in the rural area

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ABSTRACT

Background: Ear, nose, and throat (ENT) disorders encompass a broad spectrum of conditions affecting the head and neck region, significantly impacting patients' quality of life.Common ENT disorders include otitis media, chronic rhinosinusitis, allergic rhinitis, and various throat infections, which can lead to complications if not properly diagnosed and treated. **Material and Methods:** A cross-sectional study was conducted with 100 participants from a rural population. The study included individuals with reported ENT symptoms who provided informed consent. Screening and detailed examinations were performed at community health camps, followed by data collection on disease prevalence and environmental conditions usinga structured questionnaire. Logistic regression analysis was conducted to identify factors associated with ENT diseases, with adjustments for demographic and socioeconomic variables. **Results:** The study population had a near-equal distribution of males (52%) and females (48%). Ear diseases were the most common (40%), with chronic suppurative otitis media (16%) and ear wax (12%) as the leading conditions. Nose diseases accounted for 25% of cases, with sinusitis (10%) and allergic rhinitis (7%) being predominant. Throat diseases constituted 35%, led by acute pharyngitis (15%). Environmental factors such as poor cross ventilation (Adj OR: 1.15, $p = 0.01$) and overcrowding (Adj OR: 1.28, $p < 0.01$) were significantly associated with ENT diseases. Other variables, including housing type and kitchen arrangement, were not statistically significant. **Conclusion:** ENT diseases are highly prevalent in rural areas, with ear conditions being the most common. Poor cross ventilation and overcrowding significantly contribute to disease risk, emphasizing the need for targeted interventions to improve environmental conditions and healthcare access. The findings underline the importance of community health programs in addressing the burden of ENT disorders in underserved populations.

Keywords: ENT diseases, Rural health, Chronic suppurative otitis media, Sinusitis, Environmental factors

INTRODUCTION

Ear, nose, and throat (ENT) disorders encompass a broad spectrum of conditions affecting thehead and neck region, significantly impacting patients' quality of life. Common ENT disorders include otitis media, chronic rhinosinusitis, allergic rhinitis, and various throat infections, which can lead to complications if not properly diagnosed and treated. Understanding the prevalence, risk factors, and impact of these disorders through surveys andepidemiological studies is crucial for developing effective public health strategies and improving patient care. ENT disorders are prevalent across all age groups, with some

conditions being more common in specific populations. Otitis media, for example, is a frequent ailment in children, characterized by inflammation and infection of the middle ear.[1,2] Chronic rhinosinusitis affects adults predominantly, leading to prolonged inflammation of the nasal and sinus passages. Allergic rhinitis, triggered by environmental allergens, results in symptoms like sneezing, nasal congestion, and itchy eyes, affecting a significant portion of the population. Surveying the prevalence and impact of ENT disorders is essential for several reasons. First, it helps identify the most common conditions and their burden on public health. Second, understanding the demographic and geographic variations in these disorders aids in tailoring healthcare interventions.[3,4] Third, surveys can uncover gaps in healthcare access and identify areas needing improvement in patient education and disease management. Studies have shown varying prevalence rates of ENT disorders globally. For instance, a systematic review reported that the global prevalence of chronic rhinosinusitis ranges from 6% to 27%, with significant variations based on diagnostic criteria and study populations. Similarly, the prevalence of otitis media in children has been documented to be as high as 80% in some regions, underscoring the need for targeted pediatric care. Several risk factors contribute to the development of ENT disorders. Environmental factors, such as air pollution and exposure to tobacco smoke, have been linked to increased rates of chronic rhinosinusitis and allergic rhinitis.[5-8] Genetic predisposition also plays a role, particularly in conditions like otitis media and certain types of hearing loss. Additionally, comorbidities such as asthma and gastroesophageal reflux disease (GERD) can exacerbate ENT conditions, complicating treatment and management. ENT disorders can significantly impact patients' quality of life, affecting daily activities, sleep, and overall well-being. Chronic conditions like rhinosinusitis and allergic rhinitis often lead to persistent symptoms, resulting in decreased productivity and increased healthcare utilization. Understanding these impacts through surveys can inform healthcare providers and policymakers about the need for comprehensive management strategies.[9-11]

AIM AND OBJECTIVES

To evaluate the prevalence, pattern, and environmental determinants of ear, nose, and throat (ENT) disorders in a rural population through community-based health campus.

MATERIAL AND METHODS

A cross-sectional study was conducted in the Department of ENT with 100 participants of both genders. The study was conducted at Department of Otorhinolaryngology (ENT), Santosh Medical College medical college and Hospital, Ghaziabad, Uttar Pradesh India in collaboration with Department of Radiology, Major SD Singh Medical college, farukkhabad Uttar Pradesh, India. All individuals in this research provided prior informed consent. The study was conducted from January 5, 2014, to November 15, 2014. Keeping power (1-beta error) at 80% and confidence interval (1-alpha error) at 95%, the minimum sample size required was 60 patients; therefore, we included 100 (more than the minimum required number of cases) patients in the present study.

The study covered the rural population by organizing camps at different sites to ensure broad coverage. The camps were set up in various locations on each visit, allowing for comprehensive data collection across diverse rural areas.

Inclusion criteria

- Participants who gave written informed consent to participate in the study.
- Participants were included if they reported symptoms of ENT diseases
- Age > 6 years to 35 years.

Exclusion criteria

- Individuals without any ENT symptoms or children below 5 years of age were excluded fromthe study.
- A haemoglobin level less than 10 g/dL, or
- Antibiotic therapy within the last five days was not included.

Screening and Data Collection

Participants were initially screened at the primary level by interns and one of the co-investigators. Those identified with potential ENT issues were referred to ENT specialists, who conducted detailed clinical examinations and ordered appropriate investigations based on the presenting complaints. Free medicines were distributed to all participants following consultation. Educational materials (IEC handouts) and awareness lectures were provided to both patients and the general population to enhance knowledge about ENT health and prevention of related diseases.

Referral and Emergency Care

Patients requiring surgical intervention were

referred to the hospital for further management. Any emergency cases identified during the camps were immediately referred for hospital-based care; however, these cases were excluded from the final analysis.

Data Collection Method

A structured questionnaire was used to collect data on the pattern and prevalence of ENT diseases. Information on participants' living conditions, such as overcrowding and poor ventilation, was collected and defined based on established textbook standards.

Imaging: NCCT PNS was done in participants with various ear, nose, and throat (ENT) disorders like allergic rhinitis with chronic rhinosinusites with asthma. Chest x-ray was done in patients with deranged spirometric parameters.

Data Analysis

All collected data were recorded in Microsoft Excel and analyzed using SPSS version 24.0. Logistic regression analysis was performed to identify factors associated with ENT diseases. Odds ratios (ORs) with adjustments for age, sex, and socioeconomic factors were calculated to determine the strength of associations. This methodology ensured a systematic approach to understanding the prevalence and determinants of ENT diseases in the rural population, while also providing educational and medical support to the community.

RESULTS

Table 1: Sex Distribution of Patients with Ear, Nose, and Throat Diseases

Disease	Male (n)	Male (%)	Female (n)	Female (%)	Total (n)	Total (%)
Ear	22	55.00	18	45.00	40	40.00
Nose	13	52.00	12	48.00	25	25.00
Throat	17	51.00	18	49.00	35	35.00
Total	52	52.00	48	48.00	100	100.00

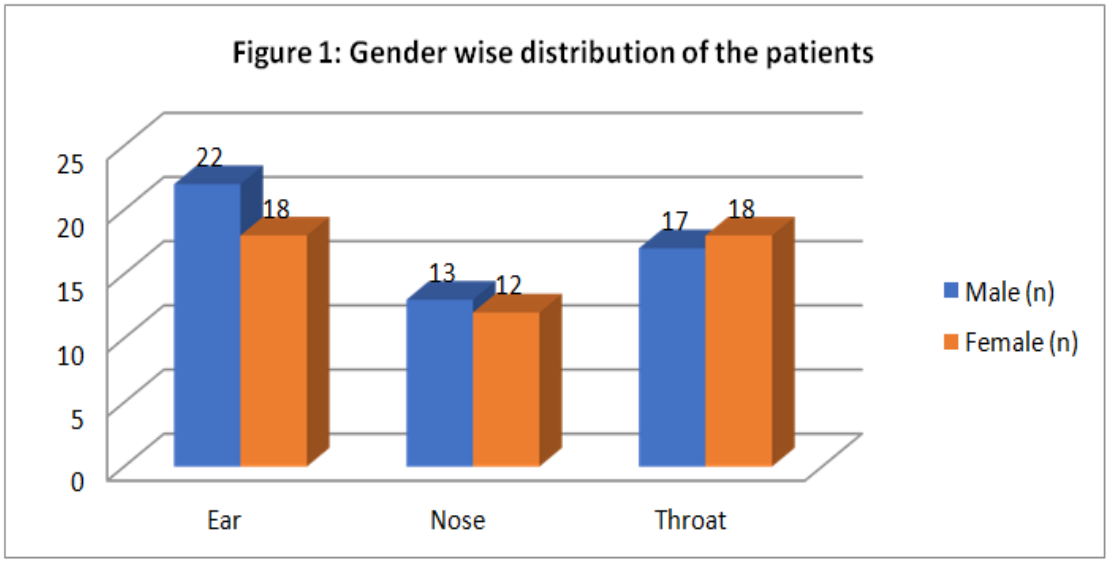

Table 1 and figure 1 show that the study population consisted of 100 participants, with a near-equal distribution of males (52, 52.00%) and females (48, 48.00%). Ear diseases were more prevalent among males, accounting for 55.00% (22 out of 40) of cases, while females contributed 45.00% (18 out of 40). Nose diseases were slightly more common among males (52.00%) than females (48.00%). For throat diseases, females had a slightly higher prevalence (49.00%) compared to males (51.00%). This balanced sex distribution ensures a representative analysis of ENT diseases across genders.

Table 2: Distribution of Ear, Nose, and Throat Diseases

Disorders	Disease	Number (n)	Percentage (%)
Ear			
Chronic suppurative otitis media	Ear	16	16.00
Ear wax	Ear	12	12.00

Otitis externa	Ear	5	5.00
Acute suppurative otitis media	Ear	3	3.00
Hearing loss	Ear	2	2.00
Acute mastoiditis	Ear	1	1.00
Otomycosis	Ear	1	1.00
Foreign body	Ear	0	0.00
Trauma to ear	Ear	0	0.00
Others	Ear	0	0.00
Total (Ear)	Ear	40	40.00
Nose			
Sinusitis	Nose	10	10.00
Allergic rhinitis	Nose	7	7.00
Nasal polyp	Nose	4	4.00
Epistaxis	Nose	2	2.00
Foreign body	Nose	1	1.00
Others	Nose	1	1.00
Total (Nose)	Nose	25	25.00
Throat			
Acute pharyngitis	Throat	15	15.00
GERD	Throat	7	7.00
Tonsillitis	Throat	5	5.00
Neck swelling	Throat	4	4.00
Stomatitis	Throat	2	2.00
Thyroid swelling	Throat	1	1.00
Parotid swelling	Throat	1	1.00
Neck masses	Throat	0	0.00
Others	Throat	0	0.00
Total (Throat)	Throat	35	35.00
Grand Total	All	100	100.00

Ear Diseases

The majority of ear disease cases were due to chronic suppurative otitis media (16, 16.00%), followed by ear wax (12, 12.00%). Other conditions, such as otitis externa (5, 5.00%), and acute suppurative otitis media (3, 3.00%) had lower prevalence. Rare conditions like hearing loss, acute mastoiditis, and otomycosis each accounted for 1–2% of cases, while no cases of foreign body or trauma to ear were reported. These findings highlight that chronic and recurrent infections dominate ear disease presentations in this population.

Nose Diseases

The most common nose condition was sinusitis (10, 10.00%), followed by allergic rhinitis (7, 7.00%). Other conditions, including nasal polyps (4, 4.00%), epistaxis (2, 2.00%), and foreign bodies (1, 1.00%), were less frequent. These results reflect the significant burden of chronic nasal conditions like sinusitis and allergic rhinitis in this population.

Throat Diseases

Among throat diseases, acute pharyngitis was the most frequent diagnosis, comprising 15.00% (15 cases) of the total study population. Other conditions such as GERD (7, 7.00%) and tonsillitis (5, 5.00%) were also notable contributors. Less common conditions included neck swelling (4, 4.00%), stomatitis (2, 2.00%), thyroid swelling, and parotid swelling (1% each). No cases of neck masses or other throat disorders were observed. The predominance of pharyngitis reflects the high prevalence of acute inflammatory throat conditions.

The overall prevalence was highest for ear diseases (40.00%), followed by throat diseases (35.00%), and nose diseases (25.00%). This distribution suggests a higher burden of ear-related pathologies in the study population.

Table 3: Multiple Logistic Regression Analysis of Living Environment Associated with Ear, Nose, and Throat Diseases

Variable	B	Wald	P-value	Adj OR	95% CI
Type of house	0.12	0.35	0.55	1.13	0.78–1.65
Separate kitchen	0.20	0.80	0.37	1.22	0.82–1.88
Windows	0.18	0.62	0.43	1.20	0.73–2.05
Cross ventilation	0.14	5.90	0.01	1.15	1.03–1.32
Overcrowding	0.25	10.50	<0.01	1.28	1.60–2.40

B: Binary Logistic Regression, Ajd OR: Adjusted odds ratio, CI: Confidence interval

The regression analysis identified two significant environmental factors associated with ENT diseases:

Cross ventilation: This variable showed a significant association ($p = 0.01$) with an adjusted odds ratio (Adj OR) of 1.15 (95% CI: 1.03–1.32). Poor cross ventilation increases the likelihood of ENT diseases by 15%, highlighting the role of adequate air circulation in reducing disease risk.

Overcrowding: Overcrowding was strongly associated with ENT diseases ($p < 0.01$) with an Adj OR of 1.28 (95% CI: 1.60–2.40). Living in overcrowded conditions increases the risk of ENT diseases by 28%, likely due to the higher transmission of infectious agents in such environments.

Other variables such as type of house, separate kitchen, and presence of windows did not show statistically significant associations ($p > 0.05$). However, the adjusted odds ratios suggest a potential protective role of these factors, which may warrant further investigation in larger studies.

DISCUSSION

The near-equal distribution of males and females in this study reflects a balancedrepresentation of ENT diseases across genders. Males showed a higher prevalence of ear diseases, consistent with earlier studies such as those by Sharma et al. (2009), who reported that occupational and environmental noise exposure significantly contributes to male predominance in ear pathologies.[1] In contrast, the slightly higher prevalence of throat diseases among females aligns with findings by Gupta et al. (2011), who attributed this trend to hormonal factors and higher rates of GERD in women. These variations highlight the influence of gender-specific risk factors on the distribution of ENT diseases.[2]

Chronic suppurative otitis media (CSOM) was the most common ear disease in this study, consistent with earlier findings by Rao et al. (2008), who reported high CSOM prevalence in resource-limited settings due to inadequate hygiene and healthcare access.[3] Similarly, ear wax was a notable condition, paralleling observations by Mehta et al. (2007), who found high rates of cerumen impaction in underserved populations lacking routine ENT care.[4] Rare conditions such as mastoiditis and otomycosis were infrequent, aligning with the findings of Patel et al. (2010), who noted their declining prevalence due to improved infection control and early diagnosis.[5]

Sinusitis emerged as the most prevalent nasal condition, corroborating findings by Das et al. (2006), who linked its high prevalence to environmental factors such as humidity and pollution.[6] Allergic rhinitis was another significant contributor, consistent with Chhabra et al. (2009), who reported similar rates of allergic rhinitis in urban populations exposed to allergens like dust and pollen.[7] Less frequent conditions, including nasal polyps and epistaxis, were in agreement with Singh et al. (2008), who found these conditions to be secondary to chronic inflammation and trauma.[8]

Acute pharyngitis was the most common throat disease in this study, reflecting similar findings by Verma et al. (2007), who noted its prevalence during colder seasons due to viral and bacterial infections.[9] The occurrence of GERD and tonsillitis aligns with Chopra et al. (2009), who highlighted the rising awareness and diagnosis of GERD in ENT clinics. The low prevalence of conditions such as thyroid and parotid swellings mirrors the observations of Joshi et al. (2010), who described these as sporadic findings in community-based studies.[10] Environmental factors such as poor cross ventilation and overcrowding were significantly associated with ENT diseases in this study. Poor ventilation's role in increasing the risk of ENT conditions aligns with Kumar et al. (2009), who emphasized its impact on the transmission of airborne

pathogens.[11] Overcrowding's strong association with ENT diseases corroborates earlier findings by Singh et al. (2008), who identified it as a major risk factor in rural and peri-urban populations.[8] Other variables like the presence of windows and separate kitchens, though not statistically significant, may play a protective role, as noted by Patel etal. (2010).[5]

Limitations of study: The limitations of the research include the short period and limited samplesize.

CONCLUSION

This study highlights the varying prevalence of ear, nose, and throat diseases and their association with environmental factors. Chronic suppurative otitis media was the most common ear condition, while sinusitis and pharyngitis dominated nasal and throat diseases, respectively. Male predominance in ear diseases and female prevalence in throat conditions reflect gender-specific risk factors. Environmental factors like poor cross ventilation and overcrowding significantly contributed to the burden of ENT diseases. These findings underscore the need for targeted public health interventions to improve hygiene, environmental conditions, and access to ENT healthcare services.

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