International Journal of Otorhinolaryngology and Head and Neck Surgery
Gupta AK et al. Int J Otorhinolaryngol Head Neck Surg. 2025 Oct;11(5):565-568
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

DOI: https://dx.doi.org/10.18203/issn.2454-5929.ijohns20252912

Original Research Article

Demographic and clinical spectrum of sinonasal masses in a tertiary care centre

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Received: 28 August 2025
Accepted: 09 September 2025

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ABSTRACT

Background: Sinonasal masses constitute a wide spectrum of pathologies, ranging from benign polyps to malignant tumors. Their clinical presentations and demographic distributions vary significantly across regions. This study evaluates the demographic profile, clinical spectrum, and preliminary histopathological correlation of sinonasal masses in patients presenting to a tertiary care center in central India
Methods: A prospective observational study was conducted over 24 months on 162 patients with clinical and radiological features of sinonasal masses. Data on age, gender, residence, socioeconomic status, symptoms, side of involvement, provisional diagnosis, and histopathology were analyzed.
Results: Most patients were aged 19–30 years (56.3%), with a male predominance (53.1%). Nasal obstruction was the most common symptom (88%), followed by anosmia (42%), headache (36%), rhinorrhea (33%), and epistaxis (13%). Rural residents accounted for 67.3% of cases. The majority were benign lesions, with Allergic polyps (40.1%) being most common. Unilateral presentation (59.2%) was significantly associated with neoplastic pathologies.
Conclusions: Sinonasal masses predominantly affect young rural adults. Clinical evaluation, supported by imaging and endoscopy, is vital for diagnosis. Public health efforts should emphasize early ENT screening and accessibility in rural populations.

Keywords: Sinonasal masses, Nasal polyps, Diagnostic nasal endoscopy, Nasal obstruction

INTRODUCTION

Sinonasal masses are frequent clinical entities in otolaryngology, representing a spectrum of conditions ranging from benign nasal polyps to aggressive neoplastic lesions.[1,2] Their manifestations can be subtle and nonspecific in early stages, often delaying diagnosis. In developing countries, the burden of sinonasal diseases is amplified by environmental exposures, limited healthcare access, and a higher prevalence of infections and allergens.[2] A growing body of literature highlights that certain demographic groups, particularly rural males in the 20–40 age bracket, are more affected. Occupational dust, smoking, pollution, biomass fuel, and underdiagnosed allergies contribute to this trend.[3,4] This study was undertaken to explore the demographic distribution and clinical presentation of patients with sinonasal masses in a tertiary care setting in central India, with a focus on early clinical patterns that could facilitate diagnosis and prompt treatment

Aims and objectives

Assess the incidence, types, and demographics of sinonasal masses. Evaluate risk factors and diagnostic findings.

METHODS

This was a prospective observational study conducted in the Department of Otorhinolaryngology at Rajmata Shrimati Devendra Kumari Singhdeo Government

Medical College, Ambikapur, over two years. Institutional ethical approval was obtained.

Study duration

The study was conducted from May 2023 to April 2025.

Inclusion criteria

All patients with clinical or radiological evidence of sinonasal mass. Age ≥6 years, ≤60 years. Consent for surgery and histopathological evaluation.

Exclusion criteria

Isolated allergic rhinitis without mass formation. Patients with contraindications to surgery. A detailed history was obtained including occupation, residence, comorbidities, and symptom duration. All patients underwent anterior rhinoscopy. Diagnostic nasal endoscopy (DNE) CT-PNS (coronal and axial views). Histopathological examination (HPE) for operated cases.

RESULTS

Demographic profile

Out of 162 patients, 86 were male (53.1%) and 76 were female (46.9%), resulting in a male- to-female ratio of approximately 1.1:1. The age range of patients spanned from 6 to 60 years, with the mean age being 29.6 years (Table 1).

Table 1: Sex wise distribution.

Sex	Number of patients	%
Male	86	53.1
Female	76	46.9

Table 2: Age wise distribution.

Age group (in years)	Number of patients	%
6-18	31	19.2
19-30	91	56.3
31-45	25	15.1
46-60	15	9.4
Total	162	100

The most commonly affected age group was between 19 and 30 years, accounting for 91 patients (56.3%), followed by the 6-18 years group (19.1%) 31 patients. This age distribution reflects a predilection for sinonasal masses in young and middle-aged adults, particularly those in their most occupationally active years, thereby emphasizing the potential socioeconomic impact of sinonasal morbidity in this population (Table 2).

Residential and socioeconomic distribution

Analysis of patients' place of residence revealed that a majority of the participants, 109 patients (67.3%), hailed from rural areas, while 33 patients (20.4%) came from urban localities, and 20 patients (12.3%) were from semi-urban settings.The predominance of rural cases may suggest a correlation with environmental exposures such as dust, biomass smoke, inadequate sanitation, and limited access to specialized medical care. It may also point toward delayed diagnosis and prolonged symptomatology before presentation to a tertiary care center (Table 3).

Table 3: Residence wise distribution.

Residence	Number of patients	%
Rural	109	67.3
Urban	33	20.4
Semi-urban	20	12.3

Clinical presentation

The most frequent presenting complaint was nasal obstruction, reported by 143 patients (88%), making it the hallmark symptom across most pathologies, both inflammatory and neoplastic. This was followed by anosmia or hyposmia in 68 patients (42%), headache in 58 patients (36%), rhinorrhea in 53 patients (33%), and epistaxis in 21 patients (13%). Several patients presented with multiple symptoms, typically combinations of nasal blockage and either anosmia or headache. Notably, epistaxis was more commonly associated with neoplastic lesions or inverted papillomas, whereas rhinorrhea was often seen in allergic conditions.

Table 4: Clinical presentation wise distribution.

Symptoms	Number of patients	%
Nasal obstruction	143	88
Anosmia	68	42
Rhinorrhoea	53	33
Epistaxis	21	13
Headache	58	36

In general, patients with allergic polyps presented earlier (within 3–4 months of symptom onset), whereas those with neoplastic lesions tended to present after more than 6 months, due to the slow-growing nature of the tumor and low suspicion levels at the primary care level (Table 4).

Laterality of disease

Out of the total non-neoplastic cases, 77 patients (70%) Bilateral nasal masses, while in Neoplastic cases, 48 patients (92%) presented with unilateral involvement. Bilateral cases were almost exclusively related to allergic polyps, particularly in patients with chronic rhinosinusitis

with nasal polyps (CRSwNP). Unilateral presentation is strongly associated with neoplastic masses, especially those that are malignant, indicating a localized origin. Benign neoplasms may occasionally appear bilaterally, but this is relatively rare. This distinction in laterality provided a useful clinical clue in stratifying patients into probable benign versus possibly aggressive lesions (Table 5).

Table 5: Laterality wise distribution.

Type of mass	Unilateral	Bilateral	Total
Non-neoplastic	33	77	110
Neoplastic			
Benign	25	04	29
Malignant	23	00	23

Provisional diagnoses based on clinical and radiological findings

The preliminary diagnostic distribution based on clinical history, nasal endoscopy, and imaging (CT-PNS) findings is as follows. Allergic nasal polyps were the most common diagnosis, seen in 65 patients (40.1%). These included both bilateral and unilateral lesions, often associated with allergic symptoms or chronic rhinosinusitis. Inflammatory polyps were diagnosed in 32 patients (19.75%). Inverted Papilloma, a benign but locally aggressive tumor, was provisionally diagnosed in 15 cases (9.25%).

Table 6: Provisional diagnosis wise distribution.

Type of mass	Number of patients	%
Non neoplastic mass		
Allergic polyp	65	40.1
Inflammatory polyp	32	19.75
Rhinosporidiosis	12	7.4
Rhinoscleroma	01	0.6
Benign neoplastic mass	29	
Haemangioma	12	7.4
Inverted pappiloma	15	9.25
Mucocele	01	0.6
Angiofibroma	01	0.6
Malignant mass	23	14.2
Squamous cell carcinoma	21	
Adenocarcinoma	02	

These were often associated with unilateral nasal masses and intermittent bleeding. Other benign tumors, such as hemangioma, angiofibroma were suspected in 13 patients (8%) based on radiologic and endoscopic features. Suspected malignancies were noted in 23 patients (14.2%). Features suggesting malignancy included irregular masses with ulceration, frequent epistaxis, facial swelling, or bony erosion on CT imaging. Miscellaneous lesions, including rhinosporidiosis, rhinoscleroma, and other rare granulomatous diseases, were seen in 13 patients (8%) (Table 6).

DISCUSSION

Sinonasal masses present a broad diagnostic spectrum, ranging from benign inflammatory polyps to rare malignant neoplasms. The findings affirm that these lesions predominantly affect younger adults, with a male preponderance and significant rural representation. This demographic and clinical profile aligns with national and international studies but also reveals region-specific variations worth deeper exploration. In the study, the most affected age group was 19–30 years (56.3%), a finding consistent with research by Kumar et al and Sharma et al who reported peak incidence in the second and third decades.[3,4] This pattern is attributed to increased occupational exposure, immune reactivity to allergens, and higher environmental exposure to irritants during the most socially and economically active years of life.

Male predominance (M:F=1.1:1) echoes global patterns noted by Dulguerov et al and Allal et al who suggested that male gender is a risk factor for both benign and malignant sinonasal pathology due to occupational exposures (e.g., dust, chemicals), higher rates of tobacco use, and less health-seeking behavior compared to females.[5] The overwhelming rural representation (67.3%) aligns with socioeconomic findings from Pradhananga et al in Nepal and Sharma et al in India.[4] Rural patients face barriers such as poor access to specialist care, reliance on home remedies, and limited awareness of ENT symptoms.[2]

In this series, delayed presentation was frequent in neoplastic lesions, where the mean symptom duration exceeded 8 months. Such delays correlate with increased recurrence and complications, as also highlighted by Bhattacharyya et al.[6] Nasal obstruction, the most common presenting symptom (88%), corroborates EPOS 2020 guidelines, which identify it as a cardinal feature of both CRS and sinonasal tumors.[7] Anosmia (42%) and headache (36%) were also highly prevalent, indicating extensive mucosal or ethmoidal involvement. These symptoms are known to impair sleep, productivity, and cognitive function, particularly in chronic disease.

Laterality serves as a useful diagnostic clue. Bilateral presentation is more characteristic of non-neoplastic masses (70%), while unilateral presentation is a hallmark of neoplastic masses (92.3%), particularly malignancies. Recognizing these trends can aid clinicians in narrowing down differential diagnoses and prioritizing further investigations, reinforcing the importance of thorough evaluation including imaging and biopsy. Histologically, allergic polyps were most common (58.6%), followed by inflammatory polyps (39%) and inverted papilloma (9.25%). These findings are consistent with Thompson et al and Chatterji et al.[8,9] The detection of 14.2% malignancies, mostly squamous cell carcinoma,

reinforces the need for endoscopic biopsy in all persistent or atypical lesions. Further stratification of histopathology revealed that eosinophilic inflammation was common in CRSwNP, correlating with both recurrence and steroid responsiveness. Recurrence in 13.6% of these patients, higher than literature averages, was likely due to follow-up challenges in rural patients.

Inverted papillomas demonstrated typical endophytic growth with intact basement membranes. Two patients showed dysplasia, reinforcing the need for regular surveillance. Malignant cases often had occupational exposure to dust and chemicals, supporting IARC's classification of sinonasal carcinogens.[10] Detailed occupational histories is essential in such cases.

Surgically, endoscopic sinus surgery (ESS) was effective for most benign masses. Powered instrumentation improved clearance and reduced recurrence. However, follow-up challenges in rural populations led to avoidable recurrences in some cases, consistent with findings by Rudmik et al and Smith et al.[11] Patients managed medically showed inconsistent outcomes. While short-term control was achieved with corticosteroids and saline, some eventually required surgery, highlighting limitations of medical therapy alone in advanced polyposis, as supported by EPOS 2020[7].

CONCLUSION

Sinonasal masses primarily affect young rural male adults, with allergic polyps being the most common type. Nasal, obstruction emerged as the hallmark symptom. Unilateral presentation often suggests neoplastic etiology, highlighting the need for prompt evaluation with endoscopy and imaging. From a public health standpoint, the rural disease burden calls for decentralization of ENT services. Training community health officers (CHOs) and primary physicians to identify ENT red flags can ensure earlier referrals. Mobile ENT clinics and district-level endoscopy setups are potential solutions.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Gupta AK, Swarnakar N, Armo U, Singh BR, Gupta S, Minj A. Demographic and clinical spectrum of sinonasal masses in a tertiary care centre. Int J Otorhinolaryngol Head Neck Surg 2025;11:565-8.