

Analyzing The Impact Of Age And Gender On Malignancy Rates In Sino-Nasal Tumors

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Abstract

Introduction: Sino-nasal tumors, a diverse group of neoplasms affecting the nasal cavity and paranasal sinuses, present varying clinical and demographic characteristics. This study aimed to assess the frequency of malignancy in sino-nasal tumors concerning age and gender.

Methods: This cross-sectional observational study was conducted at the ENT and Head-Neck Surgery department, Rajshahi Medical College Hospital, Rajshahi, from June 2014 to November 2014. A total of 60 patients presenting with sinonasal tumors were selected as study subjects by purposive sampling technique. Data analysis was done by Statistical Package for Social Sciences (SPSS) version 20.0. A descriptive method was adopted.

Result: The highest percentage falls within the 21-30 and 51-60 age groups, each comprising 20%. Males are the majority, with a male-to-female ratio of 3.3:1. The most common symptoms are nasal obstruction (93.33%) and loss of smell (70%). Most cases (93.33%) are benign, with only 6.67% being malignant, predominantly in the older age groups (51-60 and 61-70). Among the malignant cases, 75% are male, giving a male-to-female malignancy ratio of 3:1.

Conclusion: This study reveals that sino-nasal tumors are predominantly benign, with malignancies primarily found in patients over 50, particularly males. The strong male predominance in malignant cases aligns with known occupational and lifestyle risk factors. These findings suggest that age and gender are significant factors in malignancy risk for sino-nasal tumors, highlighting the need for focused screening and preventive measures in older male populations who may be at higher risk.

Keywords: Sino-nasal tumors, Malignant, Benign, Age, Gender

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I. Introduction

Sino-nasal tumors, while relatively rare, constitute a significant portion of head and neck malignancies, posing a diagnostic and therapeutic challenge due to their anatomical complexity, delayed presentation, and potential for aggressive behavior. The incidence and histopathology of sino-nasal tumors vary globally, influenced by factors such as environmental exposure, lifestyle habits, and genetic predispositions. In general, sino-nasal malignancies account for approximately 3% of head and neck cancers but have a disproportionately high morbidity and mortality due to their proximity to critical structures such as the brain, eyes, and cranial nerves [1]. Among the various subtypes, squamous cell carcinoma is the most prevalent malignancy, comprising about 70-80% of all sino-nasal cancers, followed by adenocarcinoma and neuroendocrine tumors [2]. Certain histological types, such as adenocarcinomas, are notably linked with occupational exposures, including wood and leather dust, suggesting a multifactorial etiology that intertwines genetic, environmental, and occupational factors [3]. Gender also appears to influence the risk of sino-nasal malignancies, particularly for specific histological subtypes. In their analysis of occupational risk factors, Friberg et al. identified a higher prevalence of sinonasal cancers among men, attributing this trend to greater occupational exposure to wood and leather dust in male-dominated industries [4]. Age is a well-recognized determinant in the prevalence and prognosis of sino-nasal tumors. Notably, the prognosis of sino-nasal malignancies is poorer in older adults, potentially due to the advanced stage of disease at diagnosis and the presence of comorbidities that limit therapeutic options [5]. The presentation and symptomatology of sino-nasal tumors are often subtle and overlap significantly with benign sino-nasal conditions, leading to diagnostic delays. Common symptoms include nasal obstruction, epistaxis, facial pain, and visual disturbances, which frequently mimic chronic rhinosinusitis or allergic rhinitis. As a result, sino-nasal malignancies are often advanced by the time they are diagnosed, underscoring the need for heightened

clinical suspicion, particularly in older patients or those with occupational risk factors. The high recurrence rates, aggressive behavior, and limited therapeutic options for advanced-stage sino-nasal tumors further compound their impact on patient survival and quality of life [6]. Adenoid cystic carcinoma is of glandular origin and is the 2nd most common sino-nasal malignancy. Late recurrence and distant metastases are frequent. It usually affects the ethmoid region, well known for its spread along perineural lymphatics [7]. Olfactory neuroblastoma classically arises from olfactory epithelium. Age ranged from 12 to 70 years. Cervical metastases have been described in up to 23% [8]. Lymphoma comprises approximately 6% of malignant sinonasal tumors. T/NK cell tumors are associated with Epstein-Barr exposure [9]. This study aimed to assess the frequency of malignancy in sino-nasal tumors concerning age and gender.

II. Methods

This cross-sectional observational study was conducted at the ENT and Head-Neck Surgery department, Rajshahi Medical College Hospital, Rajshahi, from June 2014 to November 2014. All patients with Sino-nasal Tumours attending in indoor department of ENT & Head Neck Surgery of Rajshahi Medical College Hospital, Rajshahi were considered as the study population. A total of 60 patients were selected as study subjects by purposive sampling technique. Detailed history taking and general examinations and Ear, Nose & Throat examinations were done & recorded in a data collection sheet by the investigator. The diagnosis was based on history taking, thorough examination (both general and systemic), and histopathological examination. The nature of the study was fully explained to each guardian and written informed consent was obtained before their enrollment in the study. Data analysis was done by Statistical Package for Social Sciences (SPSS) version 20.0. A descriptive method was adopted. After analysis data were presented in tables. Ethical clearance was obtained from the ethics committee of Rajshahi Medical College Hospital.

Inclusion criteria:

- Sino-nasal tumors of any age and any sex group.
- Patients who were willing to participate in the study.

Exclusion criteria:

- Sino-nasal mass with histological proof of benign nonneoplastic condition.
- Patients who did not give consent to participate in the study.

III. Results

Table 1: Age distribution of the patients (N=60)

Age (years)	n	%
0-10	4	6.67
11-20	8	13.33
21-30	12	20.00
31-40	8	13.33
41-50	10	16.67
51-60	12	20.00
61-70	6	10.00

The age distribution table shows that out of 60 patients, the highest percentage of cases falls within the age groups 21-30 years and 51-60 years, each representing 20% of the total. This is followed by the 41-50 years group, comprising 16.67% of patients. The 11-20 and 31-40-years age groups each account for 13.33%, while the 61-70 years group makes up 10%, and the 0-10 years group is the smallest, with 6.67%. [Table 1]

Table 2: Sex distribution of patients (N=60)

Sex	n	%
Male	46	76.67
Female	14	23.33

The sex distribution table reveals that among the 60 patients studied, a significant majority are male, with 46 cases representing 76.67% of the total. Female patients make up the remaining 23.33%, with 14 cases. In this study male to female ratio was 3.3:1. [Table 2]

Table 3: Presenting symptoms of sino-nasal tumors (N=60)

Symptoms	n	%
Nasal obstruction	56	93.33
Nasal discharge	28	46.66
Epistaxis	30	50.0
Loss of smell	42	70.0
Sneezing	18	30%
Mouth breathing	18	30%
Headache	30	50%
Epiphora	10	16.67%
Diplopia	4	6.67%

The most common symptom is nasal obstruction, experienced by 93.33% (56 patients), indicating a significant impact on airflow. Loss of smell is reported by 70% (42 patients), while epistaxis (nosebleeds) and headache are both present in 50% (30 patients) of the cases. Nasal discharge is noted in 46.66% (28 patients) while sneezing and mouth breathing are each reported by 30% (18 patients). Additionally, epiphora (excessive tearing) affects 16.67% (10 patients), and diplopia (double vision) is the least common symptom, observed in 6.67% (4 patients). [Table 3]

Table 4: Distribution of malignancy in sinonasal tumors (N= 60)

Distribution	n	%
Malignant	04	6.67
Benign	56	93.33

The distribution of malignancy in sinonasal tumors shows that out of 60 cases, the vast majority are benign, with 56 cases accounting for 93.33% of the total. Malignant cases are relatively rare, comprising only 4 cases or 6.67%. [Table 4]

Table 5: Age distribution in sino-nasal tumor (N=60)

Age Group (years)	Benign		Malignant	
	n	%	n	%
1-10	4	6.67	0	0.0
11-20	8	13.33	0	0.0
21-30	12	20.0	0	0.0
31-40	8	13.33	0	0.0
41-50	10	16.67	0	0.0
51-60	11	18.33	2	3.33
61-70	3	5.0	2	3.33

This table highlights the predominance of benign cases across all age groups, with malignant cases only present in the 51-60 and 61-70-year groups, each representing 3.33% of the total. [Table 5]

Table 6: Sex distribution of the sinonasal malignancy (n=4)

Sex	n	%
Male	03	75%
Female	01	25%

The sex distribution of sinonasal malignancy cases reveals that out of the 4 patients with malignancies, 3 are male, accounting for 75% of cases, while 1 is female, representing 25%. This results in a male-to-female ratio of 3:1. [Table 6]

IV. Discussion

The age distribution of patients reveals that the largest groups are found in the 21-30 and 51-60-year age brackets, each comprising 20% of cases, while the 41-50 age group follows with 16.67%. In contrast,

malignancies were exclusively present in patients aged 51 years and older, with no malignant cases observed in patients below this age. This distribution aligns with existing literature indicating that malignant sino-nasal tumors are generally more prevalent in older populations, possibly due to cumulative environmental exposures, immune senescence, or genetic predispositions that increase with age [1,2]. The benign tumors, on the other hand, are distributed across all age groups, suggesting a broader risk across different stages of life. This trend is similarly noted in epidemiological studies that report benign sino-nasal tumors, such as inverted papillomas and osteomas, to be relatively common in younger age groups, while malignant cases, particularly squamous cell carcinoma and adenocarcinoma, are often observed in older individuals [6,11]. The study sample is overwhelmingly male, with a male-to-female ratio of 3.3:1, as shown in. This aligns with numerous studies that report a higher incidence of both benign and malignant sino-nasal tumors in males. For instance, occupational exposures—such as to wood dust, leather dust, and chemical fumes—have historically been more prevalent among males in industries like woodworking and chemical manufacturing, which are known to increase the risk of sino-nasal carcinomas. Malignant cases in this study show a similar male predominance, with 75% of malignant cases occurring in male patients. This sex disparity is frequently attributed to lifestyle and occupational factors, as well as possible genetic differences influencing susceptibility. Research also highlights lifestyle factors, including higher smoking rates among males, as contributing to the increased risk of sinonasal malignancies, particularly squamous cell carcinoma [12]. Such findings underscore the importance of gender as a risk factor and suggest that men, particularly those over the age of 50, may benefit from more rigorous monitoring and early diagnostic screening for malignancies in the sino-nasal region. A significant feature of this study is the overwhelming majority of benign tumors, which constitute 93.33% of cases, compared to only 6.67% of malignant cases. This is consistent with the general distribution observed in clinical settings, where benign conditions, such as nasal polyps and fibromas, outnumber malignant tumors due to their lower incidence rates [13]. Benign tumors are found across all age groups, while malignancies are only present in the 51-60- and 61-70-year brackets. This observation is consistent with findings that malignancy risk in sino-nasal tumors increases with age. Studies have shown that patients over the age of 50 are more likely to develop malignant sinonasal tumors due to factors such as prolonged exposure to carcinogens and age-related immune system changes [14]. These results echo findings from large cohort studies that demonstrate age-specific incidence peaks in sinonasal cancers, with a noted increase in patients aged 50 and above, particularly for high-risk histologic types like squamous cell carcinoma and adenocarcinoma [15]. Thus, age emerges as a significant risk factor in sino-nasal tumor malignancy, underscoring the importance of age-stratified screening and early diagnostic measures for patients over 50. The sex distribution of malignancy cases further emphasizes a male predisposition toward malignancy, with 75% of malignant cases occurring in male patients. This 3:1 male-to-female ratio aligns with studies that report similar sex disparities in malignant sino-nasal tumors, often attributed to factors such as occupational exposure, smoking, and alcohol consumption—all more common among men [1].

Limitations of The Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

V. Conclusion

This study reveals that sino-nasal tumors are predominantly benign, with malignancies primarily found in patients over 50, particularly males. The strong male predominance in malignant cases aligns with known occupational and lifestyle risk factors. These findings suggest that age and gender are significant factors in malignancy risk for sino-nasal tumors, highlighting the need for focused screening and preventive measures in older male populations who may be at higher risk.

VI. Recommendation

Based on the findings of this study, it is recommended that healthcare professionals maintain a high index of suspicion for sino-nasal tumors, particularly in older male patients who present with symptoms such as nasal obstruction and loss of smell. Regular screening and early imaging may be beneficial for this demographic to facilitate early diagnosis and intervention.

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