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### Incidence, prevalence and histopathological categorization of tumour and tumor like lesions of nasal cavity at Central India

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#### A B S T R A C T

Nose is one of the important olfactory organs concerned with smell and other important sensory functions. Nose and nasal cavity constitute a common site for polypoidal masses, granulomatous lesions as commonly encountered clinical and pathological entities revealing wide spread histopathological spectrum on histopathology. The incidence of nasal masses and especially nasal polyps is approximately 1 to 4%. Study comprised of 67 cases, out of them 22.5% were benign lesions/tumors & 10.4% malignant lesions/tumors. Malignant lesions/tumors included squamous cell carcinoma 5.9% with preponderance of grade III (anaplastic) 2.9%, undifferentiated carcinoma 1.5%, adenocarcinoma 1.5% and one case of squamous cell papilloma show early malignant changes 1.5%. The incidence is continuously on the rise because of exposure to various industrial pollutants, occupational hazards and various environmental factors and viruses. Present study has been undertaken to find the incidence, prevalence and histopathological categorization of tumour and tumour like lesion of nasal cavity in population of Central India

### Introduction

The incidences of various conditions-including inflammatory, benign and malignant conditions in nasal cavity is arising more, so polypoidal condition affecting nasal cavity is on the rise. In most of the cases occupational exposures to various irritants (fumes, various metals including nickel and chromium) has been blamed as the causative factor by various authors. Evidences in support of the concept

about inflammatory polypi predisposing or getting converted to carcinoma has been inconclusive.

Nasal polyps are most frequent nasal masses which come across in various histopathological analysis Friedmann and Osborn (1976). Polypoidal and granulomatous masses in the nasal cavity can be inflammatory (Chronic polypoidal

sinusitis), bacterial (Rhinoscleroma, Tuberculoma, Leprosy), fungal (Rhinosporidiosis, Aspergillosis) etc.

Benign tumors excluding polyps include papillomas, schwannomas, meningioma, hemangioma. Malignant tumours of nasal cavity are not very common, still constitute a important cause of nasal obstruction, morbidity and mortality. Malignant tumours occur in the form of adenocarcinoma, squamous cell carcinoma, melanoma and various sarcomas. Sometimes parajiasal sinuses tumours present as a protruding nasal mass (Friedrann and Osborn, 1976).

### **Material and Methods**

Entitled work has been conducted at tertiary care centre, of central India. The material for the study consisted of nasal biopsies from outpatient and in patients admitted to ENT/Surgical wards and all the cases of nasal masses from the old records of the department of pathology at tertiary care centre routine H & E staining and special staining methods e.g. Reticulin (Gorden & Sweet) stain, periodic acid schiff's stain, mucicarmine stains, grams staining (to demonstrate bacteria) used on section prepared from biopsies.

Statistical analysis data was presented as means  $\pm$  SD. To test the significance between the study group and control groups were analyzed by student's t test. The p value ( $P < 0.05$ ) was considered to be significant.

The study consisted of analysis of 67 cases. Urban cases predominated over rural cases with the ratio of (13:1). The present data about the regional incidence could not be correlated with other studies, since similar studies have not been conducted.

As regard sex, present study shows male predominance over female with the male female ratio as (1.5:1). Similar male preponderance has been reported by Bhardwaj *et al.* (1998) with incidence of (2:1) separately. Similar male preponderance has been shown by Dandapath *et al.* (1993). The explanation for male predominance in our study can be provided on the basis of outdoor activities, jobs, occupational hazards to which males are exposed too.

As to age maximum cases belong to childhood cases from 11 to 20 years which was followed by patients in 21–30 and 31–40 years. Small number of cases belongs to after the age of 40 extending up to 80 years. This presentation or pattern reflex the occurrence of nasal lesions including polypoidal masses in early childhood extending up to early adulthood which can be explain on the basis of outdoor activities and job exposures age advances, when the malignant lesions or cancers are the most common entities. The preponderance pattern of our cases closely resembles the pattern observed in the case study by Dandapath *et al.* (1993). Number of cases again was small after the age of 50, in the same study. Mostly cases after the age of 50 had malignant lesions. Similar presentation about the cancer has been reported in various texts and studies viz. Bhardwaj *et al.* (1998), Steven G Silverberg (3<sup>rd</sup> Ed), Anderson MC (10<sup>th</sup> Ed), Symmers (2<sup>nd</sup> Ed), Willis (4<sup>th</sup> Ed), Vincent T Devita (7<sup>th</sup> Ed).

The cases most commonly presented in the form of nasal masses as well as nasal blocked. Some cases presented as in the form of epistaxis and watery nasal discharge associated with sneezing. The pattern observed in our study has been found to be similar to the observations made by Facon *et*

*al.* (2003), Vaideeswar *et al.* (1999) and Johansson *et al.* (2004).

Present study showed predominance of inflammatory lesions including nasal polyps over other benign and malignant tumours. Inflammatory conditions included-rhinoscleroma, rhinitis and rhinosporidiosis. Benign lesions included-hemangioma, papilloma and neurilemmoma. 7 cases of malignant lesions/tumour were observed included-squamous cell carcinoma, adenocarcinoma and undifferentiated carcinoma.

Inflammatory lesions were more common in males as compared to females with ratio of (1.6:1) where as benign lesions had male to female ratio (1.1:1) and the ratio incidence as regard malignant lesions was (1.3:1).

As regards duration of symptoms in nasal masses the longest duration was upto 12 years whereas duration of symptoms was shortest upto 2 years in good number of cases. This duration pattern could not be compared as analysed since such studies were not available in the literature.

Whereas histopathological diagnosis of nasal masses inflammatory lesions superseded benign and malignant lesions. Nasal polyps included both inflammatory and allergic in which inflammatory polyps predominated in a ratio of 5:1. Other chronic specific inflammatory lesions included rhinosporidiosis 12.0%, rhinoscleroma 2.9% and tuberculosis 5.9%, showing preponderance of rhinosporidiosis over other granulomatous lesions. Other workers - Dasgupta *et al.* (1996), Hellquist HB (1996), Friedmann and Osborn (1976) have analysed solely nasal polypoidal masses who have reported more of allergic cases as compared to inflammatory polyps. This reversal of pattern can be explained on the

basis of large number of cases taken for the study by above authors.

If we see the site involvement of nasal polyps the commonest site in present study has been ethmoidal sinus whereas maxillary sinus, turbinates and posterior nasal cavity were also involved. As regard site pattern similar site involvement has been reported in majority of their studies by various authors as Friedmann and Osborn (1976), Fu and Perzin (1997), Ozcan *et al.* (2005) and Larsen and Tos (2004).

As to sex the female to male ratio was 1:1.3 with male preponderance. Similar male preponderance with ratio (1:3) has been reported by Friedmann and Osborn (1976), Petruson and Hansson (1988).

Among granulomatous lesions rhinosporidiosis was diagnosed in 12% of the cases. Mostly cases belonged to farmers and school going children with preponderance in male patients. Other studies conducted by different authors as Sammadar and Sen (1990), Makannavar and Chavan and Makannavar (2001) have reported preponderance of rhinosporidiosis in male patients. Hence our findings correlate well with theirs.

As regards benign lesions which accounted for 22.5% of all the cases analysed, study showed 16.6% of hemangiomas included capillary and cavernous both with capillary type predominating in 16.6% with females predominated as compared to male in ratio of 2:1 whereas cavernous hemangioma was seen only in male patients. This pattern is correlates well with the observations by other workers as Friedmann and Osborn (1976) and Fu and Perzin (1997).

Benign lesions included only 1 case of angiofibroma, was observed in a male

patient aged 16 years with an incidence percentage of 1.5%. The sole occurrence of angiofibroma in male patient has been amply supported and reported by Friedmann and Osborn (1976), Fu and Perzin (1997), Jerome B Taxy (1996).

Two cases of squamous cell papilloma (inverted) have been reported in present study with overall percentage incidence of 2.9% in male patients and 13.3% incidence among all benign tumours. This correlates well with the study of Vaideeswar *et al.* (1999) who reported an incidence of 17.4% of papillomas among benign tumours. This may be due to lesser number of cases analysed.

A single case of Neurofibroma was observed in female patient with nasal mass and blocked. This finding could not be compared with findings of other. As regards malignant lesions which constituted 10.4% of all the cases analysed, study showed that malignant lesions in present series are mostly occur in the 61-70 yr age range (57%) with equal sex ratio (1:1). Our findings are in accordance with the reported findings of Friedmann and Osborn (1976) and Ringertz (1938).

Out of 7 malignant lesions / tumour which constituted 10.4% of all the cases analysed included squamous cell carcinoma (5.9%) with preponderance of grade-III-anaplastic ones. Grade I and Grade II were equally represented. Single cases (1.5%) each of undifferentiated carcinoma and adenocarcinoma respectively are reported. In 1 case squamous cell papilloma showed early malignant changes. The incidence ratio between squamous cell carcinoma (epidermoid carcinoma) and undifferentiated carcinoma came out to be 4:1. The squamous cell carcinoma accounted for 57.1% among malignant tumours. This

finding corresponds well with the observation by Jackson *et al* (1977), Lewis & Castro (1972) and Hopkin *et al* (1984).

Undifferentiated carcinoma accounted for 14.3% which approximately corresponds to the observation made by Jackson *et al.* (1977) and Hopkin *et al* who had reported 10% and 17% respectively.

Adenocarcinoma accounted for 14.3% which approximately corresponds to the observation made by Lewis and castro (1972). The present study of ours has been small involving histopathological aspects of nasal masses, their relationship with clinical settings and basic parameters.

Various aspects as regards malignant lesions in nasal cavity could not be touched upon. The nasal and paranasal cavities are among the commonest sites for carcinomas in nickel workers and industrial exposure to fumes and organic chemicals.

Studies utilizing immunohistological and immunohistochemical methods as well as isolation of viruses (HPV) through screening programmes along with therapeutic and prognostic aspects should be undertaken in future.

## **Conclusion**

Present study consisted of analysis of 67 cases. Following conclusions were made –

Cases from Urban areas predominated over those from Rural areas with a ratio of- 1.3:1. Most of the cases were Hindus and rests were Muslims. Hindu Muslim ratio was 15.7:1. Males predominated over females with male female ratio as -1.5: 1. Maximum number of cases with nasal lesions presented above the age of 10 yrs (95.3%). Nasal mass and nasal blocked was the most common presenting symptoms followed by epistaxis,

watery nasal discharge and sneezing. Maximum number of cases of inflammatory nasal lesions was reported in the age group of 11–20 years, while maximum number of cases of benign lesions/ tumour was reported in the age group of 21–30 years. Majority of cases of malignant lesions/tumours were reported in the age group of 61–70 yrs. In present study, inflammatory lesions accounted for 67.1% of the cases, benign lesions/ tumours 22.5% and malignant lesions/ tumours accounted for 10.4% cases. Inflammatory nasal lesions including nasal polyps predominated over other benign and malignant tumours. Benign conditions/ tumours included capillary hemangioma as the most common entity accounting 13.7%. Malignant lesions/ tumours accounting 10.4%, included squamous cell carcinoma 5.9% with preponderance of grade III (anaplastic) 2.9%, undifferentiated

carcinoma 1.5%, adenocarcinoma 1.5% and one case of squamous cell papilloma show early malignant changes 1.5%. It was observed as the age advances the incidence of neoplastic conditions show increase trends. Nasal and paranasal cavities are among the commonest sites for malignancies viz carcinomas in nickel workers and industrial exposure to fumes and organic chemicals. It was desired that study should be large and subjected to other methods viz immunohistological, immunohistochemical methods as well as isolation of viruses [e.g. HPV] through various screening programmes so that a better understanding be made and which will help in achieving better therapeutic and prognostic parameters in patients with nasal mass with special reference to cancer patients.

**Table.1** Different clinical presenting symptoms

S.No.	Presenting symptoms	No. of Cases	Percentage %
1	Nasal blocked	51	76.0
2.	Nasal mass	59	88.0
3.	Bleeding (Epistaxis)	14	20.0
4.	Watery nasal discharge (Rhinorrhea & Sneezing)	14	20.0

**Table.2** Sites involved by nasal polyps (31 cases)

S.No.	Presenting symptoms	No. of Cases	Percentage %
1	Ethmoidal sinus	13	42.0
2.	Maxillary sinus	9	29.0
3.	Turbinates (superior & middle)	6	19.3
4.	Posterior nasal cavity	3	9.7
5.	Frontal sinus	-	-

**Table.3** Sites involved by malignant lesions / tumour of the nasal cavity compared with studies of different authors

S.No.	Sites	Present study	Jackson <i>et al.</i> (1977)	Lewis and Castro (1972)	Hopkin <i>et al.</i> (1984)
1.	Ethmoid sinus	1 (14.2)	15 (13)	75 (10)	107 (19)
2.	Maxillary sinus	2 (28.8)	77 (67)	451 (58)	295 (53)
3.	Nasal cavity	3 (42.8)	19 (16)	237 (31)	147 (26)
4.	Frontal sinus	-(0.0)	3 (3)	6 (0.6)	7 (1.2)
5.	Sphenoid sinus	-(0.0)	1 (1)	3 (0.4)	5 (0.9)
6.	Site not known	1 (14.2)	-(0.0)	-(0.0)	-(0.0)
	<b>Total</b>	<b>7</b>	<b>115</b>	<b>772</b>	<b>561</b>

**Table.4** Different occupations observed in nasal lesions (67 cases)

S. No.	Occupations	No. of Cases	Percentage (%)
1	School Children	25	37.3
2	Farmers	13	19.4
3	Service	10	14.9
4	Industry (Chemical, Rubber, Paint, Wood, Cement, Textile, Chalk, Glass, Leather)	19	28.4

**Table.5** Comparison chart showing comparison of malignant lesions / tumors in present study with other workers (authors)

S.No.	Types	Present study	Jackson <i>et al.</i> (1977)	Lewis and Castro (1972)	Hopkin <i>et al.</i> (1984)
1.	Inverted squamous cell papilloma with early malignant changes	01 (14.3)	-	-	-
2.	Squamous cell carcinoma	04 (57.1)	61 (53)	496 (64)	201 (36)
3.	Undifferentiated carcinoma	01 (14.3)	11 (10)	-	92 (17)
4.	Adenoid cystic carcinoma	-	8 (7)	-	30 (5)
5.	Adenocarcinoma	01 (14.3)	7 (6)	129 (17)	40 (7)
6.	Papillary adenocarcinoma	-	2 (2)	-	-
7.	Transitional cell carcinoma	-	2 (2)	-	60 (11)
8.	Malignant melanoma	-	7 (6)	34 (4)	39 (7)
9.	Olfactory neuroblastoma	-	5 (4)	-	3 (1)
10.	Neuroblastoma	-	1 (1)	-	-
11.	Fibrosarcoma	-	3 (3)	-	11 (2)
12.	Rhabdomyosarcoma	-	-	-	-
13.	Angiosarcoma	-	1 (1)	-	-
14.	Chondrosarcoma	-	1 (1)	-	-
15.	Malignant lymphoma	-	3 (3)	40 (5)	35 (6)
16.	Plasmacytoma	-	2 (2)	13 (2)	8 (1)
17.	Carcinoma	-	1 (1)	-	-
18.	Other sarcomas	-	-	23 (3)	16 (3)
19.	Unclassified tumors	-	-	-	-
20.	Others	-	-	37 (5)	25 (5)
	<b>Total</b>	<b>7</b>	<b>115</b>	<b>772</b>	<b>561</b>

**Table.8** Histo-pathological diagnosis of tumour and tumour like nasal masses (67 cases)

S. No.	Histo-pathological diagnosis	No. of case	Sex		Percentage
			Male	Female	
<b>I</b>	<b>Inflammatory lesions</b>	<b>45</b>			<b>67.1</b>
1.	Nasal Polyps				
	- Inflammatory	26	15	11	38.9
	- Allergic	5	3	2	7.4
2.	Chronic specific infective rhinitis				
	- Tuberculosis	04	1	3	5.9
	- Rhinoselemma	02	1	1	2.9
	- Khinosporidiosis	08	8	0	12.0
<b>II.</b>	<b>Benign lesions/ Tumour</b>	<b>15</b>			<b>22.5</b>
1.	Hemangioma				
	- Capillary	09	3	6	13.7
	- Cavernous	02	2	0	2.9
2.	Angiofibroma		1	0	1.5
3.	Papillomas				
	- Squamous	-	-	-	-
	- Inverted	02	2	0	2.9
4.	Neurilemmoma	01	0	1	1.5
<b>III</b>	<b>Malignant lesions/Tumor</b>	<b>7</b>			<b>10.4</b>
1.	Inverted squamous cell papilloma with early malignant changes	01	1	0	1.5
2.	Squamous cell carcinoma				
	- Grade I	01	0	1	1.5
	- Grade II	01	1	0	1.5
	- Grade III	02	1	1	2.9
3.	Undifferentiated carcinoma	01	1	0	1.5
4.	Adeno-carcinoma	01	0	1	1.5

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