

Original Article

Topographical distribution of sinonasal malignancy

Mohammad Idrish Ali¹, Belayat Hossain Siddiquee², Md. Azharul Islam³,
AFM Ekramuddaula⁴, Sheikh Hasanur Rahman⁴, Mohammed Abdus Sattar⁴

Abstract:

Objective: In this study forty patients of sinonasal malignancy were studied to observe the topographical distribution of the disease.

Methods: This cross sectional study was done in the Otolaryngology-Head & Neck Surgery Department of Bangabandhu Sheikh Mujib Medical University during the period of January 2007 to December 2008. The diagnosis was made by detailed history, clinical examination, investigation. Analyzed data presented by various tables, graphs and figures.

Results: In this study majority of the patients were within 51-60 years of age. Male to female ratio was 3:1 and came from rural area (62.5%). Most of them were farmers (37.5%), illiterate (35%), poor socioeconomic condition (55%) and habits were smoker (37.5%). Most of the patients presented with multiple symptoms and multiple sinuses involvement (70%) and among single sinus involvement maxillary (58.34%) followed by nasal cavity (33.33%), ethmoidal sinuses (8.33%), primary frontal and sphenoid tumours were not found. About T stage of tumour T3 (42.5%), T4 (37.5%), T2 (15%) and T1 (5%). 08 cases were nodal involvement (20%), submandibular node metastasis were most common (62.5%), squamous cell carcinoma (55%), followed by adenocystic carcinoma (10%). Adenocarcinoma (7.5%), mucoepidermal carcinoma (5%), non Hodgkin's lymphoma (5%), transitional cell carcinoma (5%), small cell carcinoma (5%), chondrosarcoma (2.5%) and malignant fibrous histiocytoma (2.5%). Radiological finding with bone destruction (12.5%), without bone destruction (87.5%), intracranial involvement (45%) and orbital extension (17.5%).

Conclusion: From the review of the series it is obvious that sinonasal malignancy usually presented at advanced stage with multiple sinus involvement. In case of single sinus involvement maxillary antral carcinoma is significantly common than other sinuses.

Key words: Topographical Distribution, Sinonasal Malignancy.

1. Medical Officer, Department of Otolaryngology-Head & Neck Surgery, BSMMU, Dhaka, Bangladesh.
2. Professor, Department of Otolaryngology-Head & Neck Surgery, BSMMU, Dhaka, Bangladesh.
3. Associate Professor, Department of Otolaryngology-Head & Neck Surgery, BSMMU, Dhaka, Bangladesh.
4. Assistant Professor, Department of Otolaryngology-Head & Neck Surgery, BSMMU, Dhaka, Bangladesh.

Address for Correspondence: Dr. Mohammad Idrish Ali, Medical Officer, Department of Otolaryngology-Head & Neck Surgery, BSMMU, Dhaka, Bangladesh.

Introduction:

Cancer of the nose & paranasal sinuses though rare worldwide but more common in Japan and among the Bantu people of South Africa. Its global incidence is 0.2 to 0.8% of all carcinomas and only 3% of those in the upper aerodigestive tract. In Japan and rest of the Africa, the rates are more than double.¹ It is not uncommon in our country also.

The sinonasal malignancy arises from the tissues & structures of the nasal cavity & paranasal sinuses. Paranasal sinuses provide room for the cancer to grow. Most people do

not develop symptoms until the cancer is much advanced. Also relative unawareness of the primary physician about the disease and the similarity of the symptoms with the more common upper respiratory tract infection results in failure of true diagnosis before the tumour extends beyond the bony margins of the sinuses. So in some of the cases 1st site of involvement of cancer (maxillary or ethmoidal or nasal) could not be ascertained due to disease extent.

Site distribution of carcinoma of nose & paranasal sinuses varies in different studies. One study showed that almost half of all sinonasal tumours arise from lateral nasal wall, which represent 45%, maxillary antrum 30%, ethmoid sinus 5%, frontal & sphenoid sinus 2% and 18% cases site could not ascertain due to disease extent.^{1,2}

In another study majority of nasal cancer appear to be of antral origin 60%, 30% arise in the nasal cavities and the remaining 10% arise from the ethmoids. Primary frontal & sphenoid tumours are very rare.³

Histologically most common type is squamous cell carcinoma (about 80%). Adenocarcinoma, adenoid cystic carcinoma, transitional cell carcinoma and neuroblastoma may occur but their incidences are less. Sarcomas are also rare and tend to occur at younger age and behave in a very malignant fashion. Non-Hodgkin's lymphoma may occur but Burkett's lymphoma rarely occurs in children of this subcontinent.⁴ Melanoma also rare but usually occur in septum or lateral nasal wall of 5th to 8th decade of male population.

Sinonasal malignancy is usually diagnosed late; therefore it is important to determine the most common signs and symptoms that should alert the physician and dentist to suspect the possibility of this disease. The initial symptoms reported by the patients are

diverse and in the majority of cases are related to the face, nose & oral cavity.⁵ The Peculiarity of antral malignancy is that the involvement of the surrounding structures with the lesion is much more extensive than the symptoms revealed at presentation. The presentation of sinonasal malignancy depends on the primary site, the direction and extend of spread. The most common initial symptoms are nasal obstruction, persistent nose bleeds, headache, proptosis, epiphora, diplopia, loose teeth, facial pain & swelling, buccal or palatal swelling and nodal swelling.⁶

Previous studies in our country showed that carcinoma of the maxillary sinus topped the list (50%) among the all type of sinonasal malignancy following that is the ethmoidal cancer which account (26.6%).⁷ Although numerous studies on carcinoma of the sinonasal malignancy have been done in different countries, but very few data are available on topographical distribution in our population.²

Methods:

This was a cross sectional study done during the period from January 2007 to December 2008 in the Department of Otolaryngology-Head & Neck Surgery, Bangabandhu Sheikh Mujib Medical University. All consecutive cases (40) of sinonasal malignancy admitted in hospital and outpatient department during the study period. Patients suspected of sinonasal malignancy were evaluated properly by detailed history taking, clinical examination and relevant investigation. like CT scan, MRI and punch biopsy. Data were collected in a pre-designed data collection sheet and analyzed by using standard statistical methods.

Objectives:

To find out the sociodemographic characteristics of patient with sinonasal malignancy.

Results and Observations:

Analyzed data presented by various tables, graphs and figures.

Table-I
Age distribution in sinonasal malignancy (n=40)

Age group in years	No. of Patients	Percentage (%)
1-10	02	05
11-20	01	2.5
21-30	0	0
31-40	06	15
41-50	09	22.5
51-60	12	30
61-70	08	20
71-80	02	05

Table-II
Sex distribution in sinonasal malignancy (n=40)

Sex	No. of Patients	Percentage (%)
Male	30	75
Female	10	25

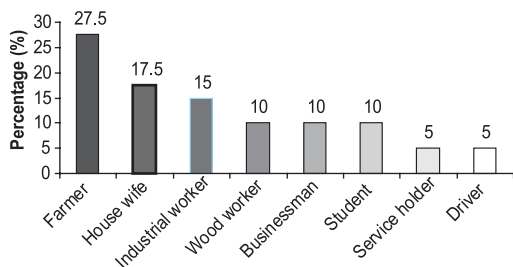


Fig.-1: Occupational study in sinonasal malignancy (n=40)

Table-III
Level of education (n=40)

Level	No. of Patients	Percentage (%)
Illiterate	14	35
Primary	10	25
Secondary	12	30
Graduate	04	10

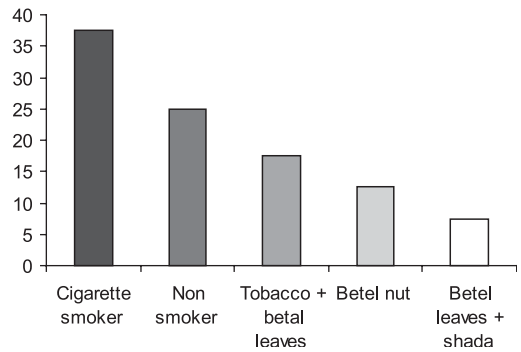


Fig.-2: Personal habits of study patients (n=40)

Table-IV
Presenting symptoms in sinonasal malignancy (n=40)

Symptoms	No. of Patients	(%)
Nasal obstruction	38	95
Nasal discharge	30	75
Swelling of face	12	30
Facial pain	13	32.5
Headache	30	75
Epistaxis	34	85
Proptosis	27	67.5
Diplopia	03	7.5
Toothache	01	2.5
Swelling of the palate	02	5
Epiphora	09	22.5
Impairment of vision	09	22.5
Loose tooth	03	7.5
Facial parasthesia	02	5
Neck swelling	01	2.5
Earache	04	10
Anaesthesia of cheek	01	2.5

Table-V*Clinical findings in sinonasal malignancy (n=40)*

Signs	No.	(%)
Nasal obstruction	30	75
Unilateral	–	18
Bilateral	–	12
Nasal mass	25	62.5
Nasal discharge	30	75
Proptosis	27	67.5
Facial swelling	12	30
Bleeding from the nose	34	85
Diplopia	03	7.5
Palatal swelling	02	5
Impairment of vision	09	22.5
Neck swelling	01	2.5
Loose tooth	03	7.5
Involvement of facial skin	05	12.5

Table-VI*Single sinus involvement of sinonasal malignancy in this study (n=12)*

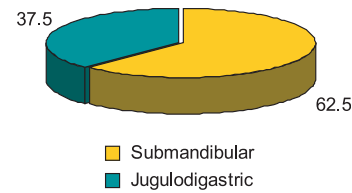
Site	No.	(%)
Maxillary sinus	07	58.34
Nasal cavity	04	33.33
Ethmoidals sinus	01	8.33

Table-VII*Multiple sinuses involvement in this study (n=28)*

	No.	%
Maxillary sinus	15	53.58
+ nasal cavity		
Maxillary sinus	09	32.14
+nasal cavity+ethmoid		
Maxillary sinus	02	7.14
+ethmoidal sinus		
+ frontal sinus		
Nasal cavity+ethmoid	02	7.14

Table-VIII*T stage of the tumour (primary) (n=40)*

T (Extension)	No.	(%)
T ₄	15	37.5
T ₃	17	42.5
T ₂	06	15.0
T ₁	02	5.0

**Fig.-3:** *Nodal involvement in sinonasal malignancy (n=08)***Table-IX***Histological types in sinonasal malignancy (n=40)*

Histology	No.	(%)
Squamous cell carcinoma	22	55.0
Adenoid cystic carcinoma	04	10.0
Adenocarcinoma	03	7.5
Non Hodgkins lymphoma	02	5.0
Malignant fibrous histocytoma	01	2.5
Transitional cell carcinoma	02	5.0
Chondro sarcoma	01	2.5
Mucoepidermoid carcinoma	02	5.0
Haemangiopericytoma	01	2.5
Small cell carcinoma	02	5.0

Table-X*Radiological findings of sinonasal malignancy (n=40)*

CT & MRI	No	(%)
CT & MRI of nose and paranasal sinus	35	87.5
With bone destruction		
Without bone destruction	5	12.5

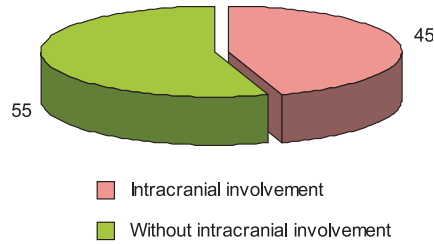


Fig.-4: Radiological evidence (CT/MRI) of intracranial involvement (n=40)

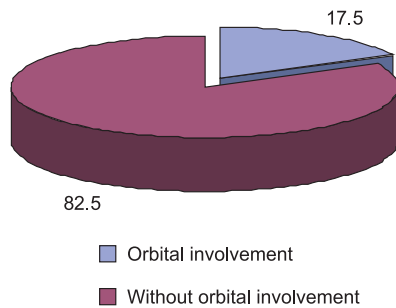


Fig.-5: Radiological evidence (CT/MRI) of orbital extension (n=40)

Table-XI

Modalities of the treatment (n=40)

Modalities	No.	(%)
Surgery + Radiotherapy	25	62.5
Post radiotherapy + Surgery	10	25.0
Inoperable (Radiotherapy ± chemotherapy)	05	12.5

Table-XII

Mortality depend upon the extension of the diseases (n=03)

	No.	(%)
Multiple sinuses + Intracranial involvement	02	66.67
Multiple sinuses	01	33.33
Ethmoid sinus	0	0.0
Nasal cavity	0	0.0

Discussion:

In this study lowest age 4 years and highest age 80 years and mean age was 49.75 years (Table-I). This is the similar to study done in our country,^{2,8} which showed mean age 52 and 55 years respectively.

Majority of the patients in this study were male and male to female ratio is 3:1 (Table-II). This was more or less similar to other study.^{2,9,10} In this series most of the patients came from rural area 62.5%.

Majority of the patients were poor socioeconomic condition (55%) and the level of education of the most of them were illiterate 35% followed by secondary 30%, primary 25% and 10% of the patients were graduate (Table-III). These findings was similar to a study carried out in our country.⁸

There is an increased risk of sinonasal cancer among cigarette smoker (Fig. 1). This study reveals (37.5%) patients having a history of smoking habits for 10 to 20 years. Non smokers 25%, tobacco chewing 17.5%, betel leaves and shada users 12.5% and betel leaves and nuts was 7.5%. These findings varies from a study done in our country and abroad. A study done in our country showed 53.33% of patients of sinonasal malignancy were cigarette smoker which was more than this study⁸ but it greater than other study¹¹, which showed other risk factors that is wood dust, nickel refining process and leather training factory.

Almost all of the patients presented with multiple symptoms, nasal obstruction were commonest symptoms 95% followed by epistaxis (85%). Headache (75%) nasal discharge (75%), facial pain (32.5%), swelling of the face 30% and proptosis (30%). Less common symptoms are impairment of vision (20%), diplopia 15%, epiphora (12.5%), earache 10%, loose tooth 7.5%, bulging of the palate 5%, facial parasthesia (5%), neck

swelling (2.5%), anaesthesia of the neck 2.5% and ill fitting denture (2.5%). These findings were more or less similar to other studies.^{2,12}

Presentation depending upon the site of involvement. In case of maxillary sinus involvement, nasal obstruction 62.5% nasal discharge 50%, nasal mass 37.5%, facial swelling 30%, facial pain 25%, proptosis 25%, loose tooth 7.5%, bulging of the palate 7.5%.

In case of nasal cavity involvement, nasal obstruction 62.5%, nasal discharge 62.5%, nasal mass 50%, proptosis 25%, facial pain 12.5%, facial skin involvement 5% and diplopia 2.5%. This findings coincide with the literature^{9,14} which showed that nasal obstruction 65%, nasal discharge 60%, nasal mass 55%, proptosis 30%, facial pain 25% and facial skin involvement 10%.

Patient with ethmoidal sinus involvement presented with nasal discharge 50%, nasal obstruction 50%, nasal mass 37.5%, headache 25%, proptosis 20%, facial pain 10%, diplopia 5% and facial skin involvement 5%. This findings are similar to David (1988)¹⁵ which showed that nasal discharge 60%, nasal obstruction 45%, nasal mass 40%, headache 30%, proptosis 30%, facial pain 15%, diplopia 5% and facial skin involvement 5%. Which were significantly similar to our study (Table-V).

The origin of the primary tumour was determined by clinical examination, endoscopy and various imaging procedures, mostly CT scan. Site distribution of carcinoma of the nose and paranasal sinuses varies in different studies, primary site could not ascertain due to disease extension and late presentation, this is may be due to lack of awareness and poor socioeconomic condition patient presented in advanced stage.

This study showed that majority of the patients presented with multiple sinus

involvement 70%. This is consistent with the findings of others.^{11,12} But among single sinus involvement maxillary sinus most common site 58.34%, followed by nasal cavity 33.33%, ethmoidal sinus 8.33%, primary frontal and sphenoid tumour were not seen in our study. This is consistent with the study¹¹ which showed that maxillary sinus 44% nasal cavity 50% ethmoidal sinus 4% (Table-VI).

Among the multiple sinus involvement maxillary sinus and nasal cavity 53.58%, maxillary sinus, nasal cavity ethmoid sinus 32.14%, maxillary sinus ethmoidal sinus, nasal cavity 7.14%. Nasal cavity ethmoidal sinus 7.14%. This finding is coincide with Crowley's study.¹⁶

Primary extension of the tumour status were assessed by thorough clinical and radiological examination shows a decreasing order of frequency T₃ 42.5%, T₄ 37.5%, T₂ 15% and T₁ 5%. This is consistent with a study.⁸

In our series, out of 08 cases of nodal involvement that is 20%. Among them submandibular node metastasis was 62.5% and jugulo diaphragmatic node involvement was 37.5%. This is not correlated with the study.^{11,12} This is due to late presentation of our patient, which study showed that nodal involvement 10% (Fig. 3).

Squamous cell carcinoma was by far the most common type 55%. This is consistent with our study,¹¹ which showed 45% of the patient with sinonasal malignancy were squamous cell carcinoma. Adenocystic carcinoma 10% is the 2nd most common in this study but it was differ from other study that showed adenocarcinoma was 2nd common from of sinonasal malignancy. Among other histological varieties in this series adenocarcinoma 7.5%, non Hodgkin's lymphoma 5% and malignant fibrous histiocytoma 2.5% most common in 1st and 2nd decade of life. Transitional cell carcinoma

5%, mucoepidermoid carcinoma 5%, small cell carcinoma 5%, chondrosarcoma 2.5% and haemangiopericytoma 2.5%.

About grading, out of 22 cases of squamous cell carcinoma maximum was grade III, 52% followed by grade IV 18.18%, grade I, 18.18% and grade II, 13.64%. This finding are nearly consistent with the findings of another series¹⁷ which showed T₃ 45% cases, T₄ lesion in 33%, T₂ 18% and T₁ 12%.

Bone destruction is commonly found in the sinonasal malignancy at the time of presentation regarding CT scan of the nose and paranasal sinus both axial and coronal view showed with bone destruction 87.5% cases and without bone destruction was 12.5%. This not consistent with the other study¹⁸ it may be due to late presentation of the patients in our country (Table-X).

CT scan was carried out all of the patients with intracranial involvement found at the time of diagnosis in 45% and orbital involvement in 17.5% which is more or less similar to other study¹⁹ (Fig. 4).

In this series the patients who were potentially curable were treated by combination of surgery and radiotherapy 62.5%. This is consistent with study by Watkinson.²

Some patients treated with radiotherapy followed by surgery 25%. With consideration of disease extension and patients general condition 5 cases were considered as inoperable and treated with radiotherapy ± chemotherapy (Table-XI).

Mortality is depending upon the extension of the disease. In our study out of 40 cases 03 (7.5%) were died. Most common are in multiple sinuses with intracranial involvement 66.66%, followed by maxillary sinus 33.33% (Table-XII). One had died due to peroperative cardiac arrest, one died of postoperative electrolyte imbalance and another died due

to extensive surgical maneuver followed by cerebral oedema.

Conclusion:

Site distribution of carcinoma of nose and paranasal sinuses varies in different studies. Our present study is intended to out line the distribution of sinonasal malignancy in different anatomical regions and sites according to frequency. From the review of the series it is obvious that sinonasal malignancy usually presented at advanced stage with multiple sinus involvement. In case of single sinus involvement maxillary antral carcinoma is significantly common than other sinuses.

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