ISSN NO. 2320-5407

Journal homepage: http://www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH

RESEARCH ARTICLE

Clinicopathological study of lesions of sinonasal tract & Distribution of Sinonasal tract lesions in difefferent age groups & Sex.

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Manuscript Info

Manuscript History:

Received: 15 February 2015
Final Accepted: 22 March 2015
Published Online: April 2015

Key words:

sinonasal tract,paranasal sinuses,neoplastic lesions,non-neoplastic lesions

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Abstract

The nose is one of the important organ for physical looks of man and is also an organ through which he perceives our external environment. It has both general and specific functions .The nasal cavity and paranasal sinuses–including the maxillary, ethmoid, sphenoid and frontal sinuses- are collectively referred to as sinonasal tract.one peculiarity about this region is the presence of many specialized tissue with its own aberrations which is responsible for large number of diseases affecting these structures This is a prospective type of Study done at V.S.S.Medical College ,Burla from October 2010-September 2012. patients of all age groups belonging to either sex presenting with sino-nasal masses coming to department of Pathology from ENT OPD and inpatient department of Otorhinolaryngology of V.S.S Medical College,Burla.Total 134 cases were studied .After clinicopathological correlation it was found that nonneoplastic sinonasal lesions are more than neoplastic lesions &among the neoplastic lesions benign lesions are more than malignant lesions. It is evident that more than 65% cases were observed in adolescents and young adults. Incidence in paediatric and older population is very low. The lesions of sinonasal tract are more common in males.

INTRODUCTION

The nose is one of the important organ for physical looks of man and is also an organ through which he perceives our external environment. It has both general and specific functions**[20]** .The **nasal cavity** and **paranasal sinuses**–including the maxillary, ethmoid, sphenoid and frontal sinuses- are collectively referred to as sinonasal tract.one peculiarity about this region is the presence of many specialized tissue with its own aberrations which is responsible for large number of diseases affecting these structures**[23]**

A variety of non-neoplastic and neoplastic conditions involve the nasal cavity, paranasal sinuses and nasopharynx.These are very common lesions encountered in clinical practice**[23]**.

Since the day of Hippocrates, the Father of medicine, nasal masses have been known as a common affliction of man**[14]**. These masses may be neoplastic or non-neoplastic .Non-neoplastic lesions are mostly inflammatory which may be allergic,traumatic or granulomatous. The commonest nasal mass seen is the polyp**[11]**.

The nose and the paranasal sinuses are very rare sites of origin of head and neck tumors. Neoplasms of nasal cavity and sinuses account for 0.2-0.8% of all neoplasms , only 3% of those occur in the upper aerodigestive tract**[8] .**

The diagnosis of sinonasal malignancies is challenging. Not only they are rare, but also difficult to distinguish from their benign counterparts[43]. Furthermore, the complexity of the anatomy and their proximity to eye, brain, and cranial nerves, render radical surgery and radiation therapy difficult as such treatments are associated with numerous complications.

Various etiological factors resulting from industrial exposure have been linked to malignant tumors of the sinonasal tract, which includes nickel, chromium, wood dust, leather, formaldehyde, mineral oils, isopropyl oils, lacquer paint, soldering/welding, radium paint, irradiation, snuff and cigarette smoking. Hardwood dust exposure has a particular association with adenocarcinoma of the ethmoid sinuses. Association of certain dietary factors and malignancy of the nasal and paranasal sinuses have also been noted. Alcohol and salted/smoked foods are linked to increased risk whereas fruits and vegetables are linked to decreased risk**[8]**.

The presentation of sinonasal malignancy depends on the primary site, the direction and extent of spread[11]. The initial symptoms reported by the patients are diverse. Majority of cases are related to the face, nose & oral cavity. The most common initial symptoms are nasal obstruction, epistaxis, proptosis, epiphora, diplopia, loose teeth, facial pain & swelling, buccal or palatal swelling**[11]** .Key indicators of malignancy such as cranial neuropathies and proptosis are uncommon at initial presentation and signify advanced disease[13].

The presenting symptomatology of all tumours is similar. Histopathological examination is necessary to decide whether any particular tumour is malignant**[18]**. The sino-nasal epithelium is an uncommon site for neoplastic process and can present an entire range of both epithelial and non-epithelial tumors**[15]**. It is imperative that the clinicians should be aware of these rare lesions because the eye is blind for what the mind does not know**[20]**.

The presence of nodal involvement drastically reduces the prognosis and 5 years survival rate come down from 27.2% to 6.8%. The most common site of distant metastases is bone. Metastases may also occur in the lungs, liver, brain and kidney**[18]**.

Gross appearance of the sinonasal tract and nasopharyngeal malignancies has limited value in aiding diagnosis, because the initial diagnosis depends on the tissue obtained by endoscopy or polypectomy**[21]**.

Despite their infrequence, they represent both a diagnostic and therapeutic challenge because the presenting signs and symptoms may be indistinguishable from benign or inflammatory disorders**[13]**. The relative unawareness of the physician about the disease and similarity of symptoms with the more common upper respiratory tract infection results in failure of true diagnosis before the tumor extend beyond the bony margins of the sinuses**[18]** .

The presenting features, symptomatology and advanced imaging technique help to reach a presumptive diagnosis but histopathological examination remains the mainstay of final definitive diagnosis. Thus, careful histological workup is essential for a correct diagnosis and timely intervention**[23]**.

MATERIALS AND METHODS

Type of study:prospective

Study period:October 2010 to September 2012

Place of study:Department of Pathology,V.S.S medical college ,Burla

patients of all age groups belonging to either sex presenting with sino-nasal masses coming to department of Pathology from ENT OPD and inpatient department of Otorhinolaryngology of V.S.S Medical College,Burla.Total 134 cases were studied

Exclusion criteria : Lesions of the nasopharyngeal region and lesion arising from the external nose were not included in the study

The histopathological and clinical data from 134 cases were analysed. The lesions were classified as nonneoplastic and neoplastic.. The neoplastic lesions were further classified according to WHO classification on histopathologic examination and observations were compared with other studies.Case History was taken.Present complaint with duration,Rate of growth also taken in to account. Local Examination was done Radiological Investigations (X-ray,CT-scan) if required .Clinical diagnosis also taken in to account.Surgical biopsy morphology (Gross dimensions, capsule, colour and consistency.Cut-section- solid, homogenous/variegated, haemorrhagic, necrosis, calcification). was studied

1. **Tissue processing and section cutting**

The selected mass or the biopsy specimens were obtained from the operation theatre in the containers using 10% formal saline as a fixative. The sample or specimen received was examined macroscopically and kept in the fixative solution for 24 hours. Appropriate numbers of 5 mm thick bits from the representative areas were processed in automated tissue processor as follows:

- Dehydration .,Clearing,Impregnation

2. **Preparation of Block**
   After paraffin impregnation blocks were prepared by transferring it from the final wax bath to a mould filled with molten wax, inverting the tissue to free the surface to be cut from air bubbles and oriented so that this surface rests on the base of the mould. The block was then cooled quickly.
3. **Section Cutting**
   The block was attached to the holder and kept in cold water for 15 minutes. The tissue was then cut at 5 micron thickness by rotatory microtome. The section was placed on the slide previously coated with egg albumin and allowed to dry. The slide was kept on the heated surface for about 10 minutes in order to coagulate the egg albumin so that the sections will be fixed.
   All tissue sections were stained routinely with haematoxylin and eosin as per the following steps.
   Then tissue was studied under microscope & histological diagnosis was given

- Microscopic findings:
  - Low power
    - Architecture
    - Cellular morphology
    - Characteristics of stroma
  - High power
    - Degree of cellular differentiation
    - Type of cellular differentiation
    - Cytoplasmic features
    - Nuclear features
    - Mitotic figures
    - Necrosis

OBSERVATION

The table-I shows that during the two years period a total 134 cases of sinonasal masses were studied, out of which 73 cases (54.48%) were non-neoplastic lesions and 61 cases(45.52%) were neoplastic lesions. Among the neoplastic lesions, 38 cases(28.36%) were benign tumours and 23 cases(17.16%)were malignant tumours. table II, it is evident that more than 65% cases were observed in adolescents and young adults. Incidence in paediatric and older population is very low. Table III shows that lesions of sinonasal tract are more common in males.

Discussion

Sinonasal mass is a common finding in the otorhinolaryngology Department. It is found in almost all age groups of people. These masses may be inflammatory or neoplastic. The presenting features ,symptomatology and advanced imaging technique help to reach a presumptive diagnosis but histological examination remains the mainstay of final definitive diagnosis.

In this study, 54.48% of the cases were non-neoplastic, 45.52% cases were neoplastic.The proportions of non-neoplastic and neoplastic lesions in different studies by other shown in Table IV.The distribution of non-neoplastic and neoplastic lesions in the present study correlated well with that of **Zafar et al[24]** and **Ologe and Adeniji[17].**Out of the neoplastic lesions, benign tumors (62.29%) outnumbered the malignant tumours (37.70%) in the present study which agrees with **Chukuezi and Nwosu[9]**who reported 58.97% benign tumours and 41.03% malignant tumours. But this finding differed from that of **Humayun et al[12]** who observed a higher percentage of malignant tumours (80%) out of all the sinonasal tumors. They attributed it to the complicated management and obvious morbidity of the sinonasal malignancies for which there was increased referral of patients to government hospital from private clinics.

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The maximum number of cases of non-neoplastic lesions was found between 2^{nd} to 4^{th} decade of life in this study which closely correlates with that of **Zafar et al[24]**who observed most of the non-neoplastic cases presenting in the 2^{nd} and 3^{rd} decade. **Humayun et al[12]** reported most of the non-neoplastic cases in their series in 2^{nd} decade because of occurrence of most of the inflammatory lesions in this age group. Benign tumours in the present study was found in 2^{nd} - 4^{th} decade which coincides with the findings of many authors like **Bakari et al[4]** who reported 2^{nd} - 5^{th} decade to be the predominantly affected age group. Similarly, 4^{th} decade was reported by **Humayun et al[12]**

and 2nd decade reported by **Swamy and Gowde[22]**. **Ologe and Adeniji[17]** who found 68.9% of the benign tumours in patients below 40 years of age, has proposed many reasons for the relatively young age of presentation. Firstly, lower life expectancy in the tropics and other developing countries. Secondly, tumors tend to occur in younger age groups in Africa and other third world countries compared to Europe and America. Thirdly, hospital attendance is mainly by the young people because of long standing faith in traditional medicines and methods by the elderly patients.

The most common age group affected by the malignant sinonasal tumours was 5th - 7th decade in the present study. Similar finding has been reported by **Salam et al[19]** who reported peak age of 5th – 7th decade. However in Nigeria, a comparatively younger age for malignant tumors was reported by **Fansula and Lasisi[10]** who found peak age at the 5th decade for epithelial malignancies and 2nd and 3rd decade for non-epithelial malignancies. They attributed the lower age for malignancies to lower life expectancy in Nigeria which is 44 years compared to other countries and increased HIV infection in their region which is one of the predisposing factors for malignant lymphoma.

In our study male predominated in both non-neoplastic and neoplastic groups. The male-to-female ratio was 1.7:1 for non-neoplastic lesions which correlates with **Zafar et al[24]** who reported a ratio of 1.7:1. The proportion of male and female for benign tumours in our study was 1.7:1 which agrees with that of **Swamy and Gowde[22]** who found a ratio of 2.7:1. These findings differed from that found by **Bakari et al[4]** who reported a female preponderance with a male-to-female ratio of 1:1.5 which was due to preponderance of nasal polyp and inverted papilloma in female.The male-to-female ratio for malignant tumours was 2.3:1 which nearly resembles that of **Fansula and Lasisi[10]** who reported a ratio of 2.1.

TABLE-I
INCIDENCE OF NON-NEOPLASTIC AND NEOPLASTIC LESIONS

TYPE OF LESION	**NO. OF CASES**	**%**
Non-neoplastic	73	54.48
Neoplastic		
Benign tumors	38	28.36
Malignant tumors	23	17.16
TOTAL	134	100.00

TABLE II
AGE DISTRIBUTION OF NEOPLASTIC AND NONNEOPLASTIC LESIONS

AGE GROUPS IN YEARS	**TOTAL**
<10	2(1.49%)
11-20	17 (12.68%)
21-30	30 (23.28%)
31-40	37 (22.39%)
41-50	15 (11.19%)
51-60	16 (11.94%)
61-70	12

	(8.95%)
>70	5 (3.73%)
TOTAL	**134** **(100%)**

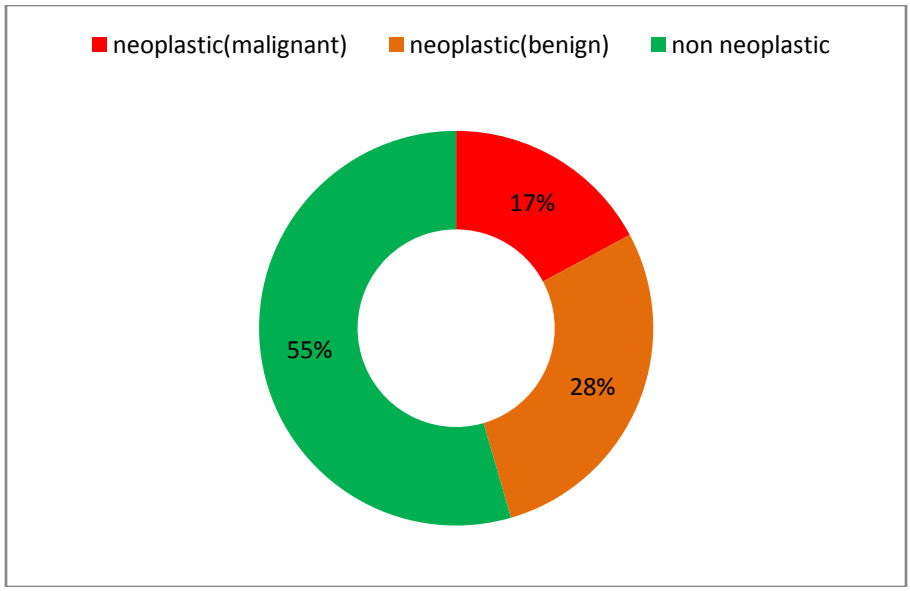
Table III
SEX DISTRIBUTION OF NEOPLASTIC AND NONNEOPLASTIC LESIONS

sex	NUMBER
MALE	86(64.18%)
FEMALE	48(35.82%)
TOTAL	134(100%)

Table IV THE PROPORTIONS OF NON-NEOPLASTIC AND NEOPLASTIC LESIONS IN DIFFERENT STUDIES BY OTHER AUTHORS ARE AS FOLLOWS:

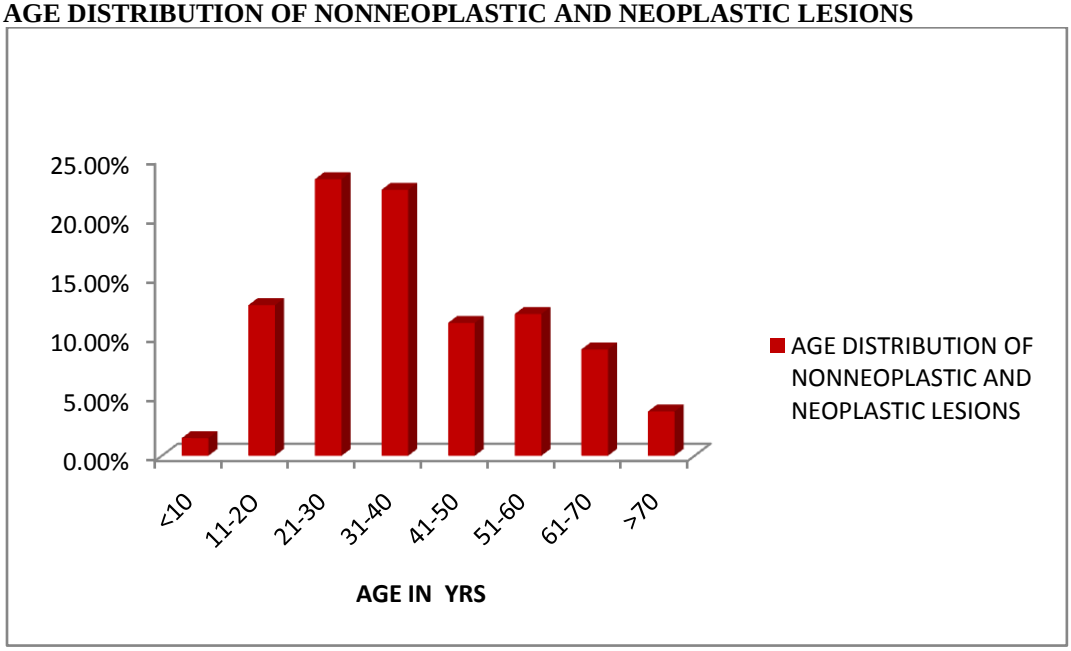
AUTHORS	**TYPES OF LESION**	
	NON-NEOPLASTIC	**NEOPLASTIC**
Humayun et al[12] Total no. of cases= 50	70%	30%
Zafar et al[24] Total no. of cases= 240	60%	40%
Ologe and Adeniji[17] Total no. of cases= 63	57.13%	42.87%
Al-Husban and **Hattar**[3] Total no. of cases = 160	81%	19%
Bakari et al[4] Total no. of cases=76	72.8%	27.2%
Present study Total no. of cases= 134	54.48%	45.67%

GRAPH 1
INCIDENCE OF NON-NEOPLASTIC AND NEOPLASTIC LESIONS



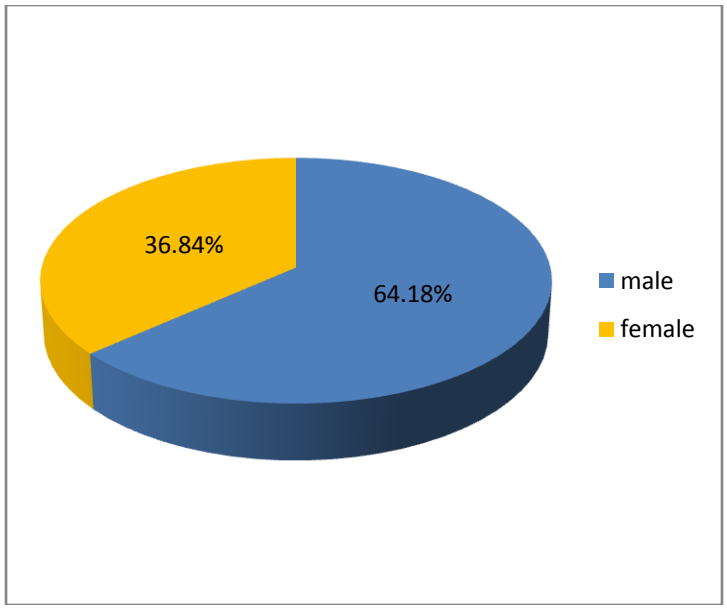
GRAPH II

AGE DISTRIBUTION OF NONNEOPLASTIC AND NEOPLASTIC LESIONS



GRAPH III

SEX DISTRIBUTION OF LESIONS OF SINONASAL TRACT



CONCLUSION:

It was found that nonneoplastic sinonasal lesions are more than neoplastic lesions &among the neoplastic lesions benign lesions are more than malignant lesions. It is evident that more than 65% cases were observed in adolescents and young adults. Incidence in paediatric and older population is very low. The lesions of sinonasal tract are more common in males.

AKNOWLEDGEMENT:

I am verymuch thankful to previous professor & H.O.D ,V.S.S.Medical College,Burla ,Prof. Debi Prasad Mishra for his support & My previous Guide Dr M.A.Khan for his guidance

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