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Study of The Relation of Deviated Nasal Septum with Chronic Rhinosinusitis in A Teaching Hospital of Western India.

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ABSTRACT

Chronic rhinosinusitis (CRS) is one of the most common disorders diagnosed at ENT OPD. CRS is a chronic disease that affects 14.2% of the adult population. It is a disease that involves long term inflammation of nasal and paranasal sinuses mucosa. Any factors that causes block of Osteomeatal complex (OMC) makes nasal and sinus mucosa susceptible to penetration and potential inflammation by bacteria. When this infection and damage is persistent and prolonged (more than three months) it becomes CRS. Deviated nasal septum (DNS) with its angulation along with abnormalities of OMC is the major contributing factor of this. The control CT scan is indicated in patients with CRS in order to properly consider treatment option and sequence the steps in the evaluation. Mucosal opacification, bony changes, DNS or air fluid levels seen on CT are consistent with CRS. So, when there is documented underlying disease in CRS, treatment of the underlying conditions may help to relieve symptoms as well. CRS causes not only physical suffering but also impacts psychological well being and daily activities. So, it is utmost important to diagnose and treat this condition. This is a retrospective cross-sectional observational study included population of 72 diagnosed case of CRS attended among them 50 have PNS and 22 have history of allergy. Here Cottle's classification is used for angulation of DNS and CT scan Lund-Mackay score is used for diagnosis of CRS. The commonest sinus involved was maxillary sinus seen in the CRS cases. Another study also comments sinus involved was maxillary sinus. According to CT scan finding majorities cases had the score in the range of 5 - 8, Lund Mackay CT scoring system along with grade II or grade III in DNS also similar finding were noted by earlier authors. According to this study we can conclude that DNS (60%) grade II along with OMC abnormalities is the key factor for CRS. DNS is the principal reason for sinusitis.

Keywords: Chronic rhinosinusitis, Deviated Nasal Septum, Osteomeatal complex.

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INTRODUCTION

The term chronic sinusitis defined as a group of disorders characterize by inflammation of the mucosa of nose and paranasal sinuses of at least 12 consecutive week duration by Benninger et al, 2003 [1]. Patients suffer from chronic sinusitis also often complaint of lower workplace productivity and social embarrassment as well as an overall decline in self confidence.

It is a heterogeneous entity that may be due to a number of different contributing factors like deviated nasal septum, allergic rhinitis, chronic bacterial infections, anatomical variation of osteomeatal complex region like variation of uncinata process, ethmoid bulla, middle turbinate, haller cells, agger nasi cells. However 80% peoples have DNS. The condition can result in poor drainage of sinuses causing sinusitis [2]. A close association has been suggested between sinusitis, asthma and Allergy [3,4].

The CT scan is the gold standard investigation all sinus diseases and it gives detail bony anatomy of the osteomeatal area and serves as an anatomic roadmap for the operating surgeon, various studies showed that, it is a deviated septum, which results in the OMC disease and compensatory conchal hypertrophy and enlarged ethmoid bulla [5]. But in very few studies angle of septal deviation has been measured on CT scan and its relation with sinusitis seen [6].

AIMS:

- i. To study the occurrence of the various grades of DNS in terms of angles and anatomical variation of osteomeatal complex region on CT scan.
- ii. To study relation of various degrees of DNS.

MATERIAL AND METHODS

Sample population of 72 diagnosed case of CRS, who were attending ENT OPD of Mahatma Gandhi Institute of Medical Sciences, Sevagram from 1st September 2014 to 31st August 2015. This is a retrospective cross-sectional observational study in which all those patients with clinical diagnosed as having DNS, chronic rhinosinusitis (CRS) and nasal obstruction secondary to anatomical variations of osteomeatal complex will be eligible for participation in the study.

Inclusion criteria:

- i. All patients of both sexes with age above 12 years.
- ii. Diagnosed cases of DNS, chronic rhinosinusitis, anatomical variations of osteomeatal complex.
- iii. Patients willing to participate in the study.

Exclusion criteria:

- i. Patients with acute sinusitis, allergic sinusitis asthma cystic fibrosis, immune deficiency, metabolic diseases or malignant diseases or those who had previously undergone nasal or sinus surgery.
- ii. Maxillofacial trauma cases.
- iii. Children 12 year of age were excluded from the study.
- iv. Pregnant women.
- v. Co existent systemic disease like hypertension, diabetes etc.
- vi. Patient with known psychiatric illness.

The degree of deviated nasal septum was graded according to Cottle's classification [7,13]. Deviation was also being noted in vertical and horizontal planes. Other structural abnormalities like spur, caudal dislocation, if present, was also be recorded.

Cottle's classification:

- Grade – I
- Grade – II

Grade – III

These cases were subjected to following investigations:

1. X-ray PNS (water’s view).
2. Diagnostic nasal endoscopy.
3. Pus from middle meatus (routine culture & sensitivity b) AFB.
4. CT scan of paranasal sinuses.

On nasal endoscopy, anatomical variations in the OMC region grade and type of deviated septum and signs of sinusitis and the involved sinuses were noted. On CT scan coronal view is the best section passing through OMC associated anatomical variation was be seen ^[9]. The sinusitis on CT scan was graded by Lund-Mackay’s classification [10,11].

Table 1: Degree of DNS will be graded by the following classification.

Grade- I	0 ⁰ - 10 ⁰
Grade- II	11 ⁰ - 20 ⁰
Grade- III	21 ⁰ - 30 ⁰
Grade- IV	>30 ⁰

Correlations between degrees of DNS and anatomical variations at OMC were done with sinusitis.

Statistical evaluation: By using standard method (chi square test).

$$X^2 = \frac{(O - E)^2}{E}$$

Where O = Observed data, E = Expected data

- Search strategies:
1. Medline data base
 2. Internet
 3. Pubmed

Table 2: Diagnostic criteria for chronic rhinosinusitis [12]:

S. no.	Major Factors	Minor Factors
1	Facial pain / Pressure	Headache
2	Facial congestion /fullness	Fever
3	Nasal obstruction /blockage	Halitosis
4	Nasal discharge / purulence /discolored postnasal drainage	Fatigue
5	Hyposmia / anosmia	Dental pain
6	Purulence on nasal cavity examination	Cough
7	-----	Ear pain /Pressure fullness

A CRS diagnosis requires any one of following:

- I. Presence of at least two major factors.
- II. One major factor with two or more minor factors.
- III. Nasal purulence on examination.

The sign and symptoms must persist for at least 12 weeks to qualify as CRS.

Table 3: Lund-Mackay score of CT scan Scoring.

Para Nasal Sinus (PNS)	Right	Left
Maxillary (0,1,2)		
Anterior ethmoid (0,1,2)		
Posterior ethmoid (0,1,2)		
Sphenoid (0,1,2)		
Frontal (0,1,2)		
OMC (0,2)		
0 = No obstruction 1 = Partial obstruction 2 = Total obstruction		

OBSERVATION AND RESULTS

Present clinical study included a sample population of 72 diagnosed case of CRS attended in ENT OPD at MGIMS Sevagram hospital, among them 50 have PNS and 22 have history of allergy, in these DNS cases 32 were female and 18 were male (ratio of M:F=1:1.7) (Graph 1).

The youngest patient in this sample was 14 year old girl and oldest patient were 58 year of man of the symptom complex. CRS affected maximum number of patients comes in between age group 20-30 and 31-40. Age wise distribution of cases showed in Graph 2.

All of them (100%) presented with headache along with heaviness of head. 30 Of them (60%) had nasal obstruction and 20 patients (40%) presented with history of post nasal discharge. 10 patients (20%) had complaints of partial or complete anosmia (Graph 3).

Table 4: Showed grade of DNS wise distribution of cases.

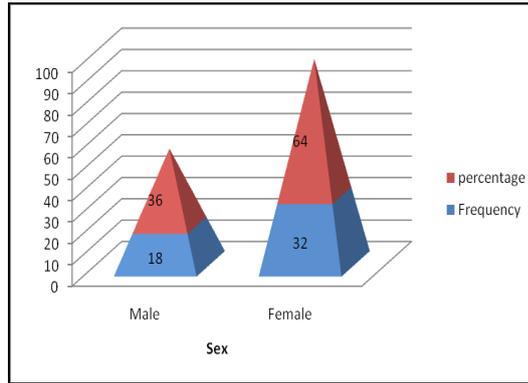
Grade	Frequency
I(0-10 degree)	5 (10%)
II (11-20 degree)	23 (46%)
III (21-30 degree)	15 (30%)
IV (More than 30 degree)	7 (14%)

Table 5: Showed CT (Computed tomography) findings wise distribution of cases.

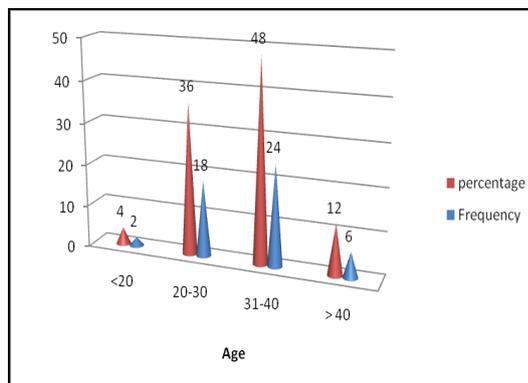
CT score	Frequency
0-4	2 (4%)
5-8	20 (40%)
9-12	20 (40%)
13-16	8 (16%)

Patients suffering from CRS the clinical and laboratory data from the study cases were recorded as per proforma the study included patients of different age group of various socio-economic statuses of the sexes. The results were them compared with available literature a close association has been suggested between sinusitis and allergy [9]. CRS affected maximum persons at young age their third to fourth decade. CRS of this region showed a female redominance all patients had history of headache with heaviness of head with or without nasal obstruction and post nasal drip.

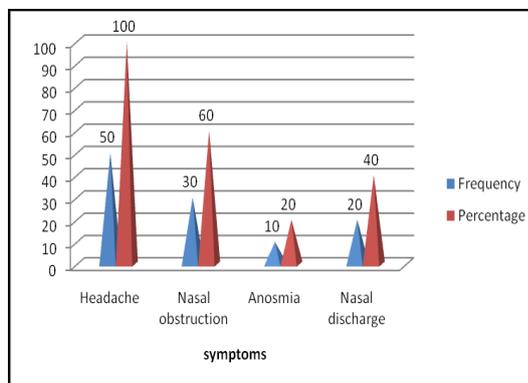
Grade II and grade III DNS along with other osteomeatal complex abnormalities is the key factor of majorities of CRS cases [13]. The commonest sinus involve was maxillary sinus seen in the CRS cases. Another study also comments sinus involved was maxillary sinus [4]. According to CT scan finding majorities cases had the score in the range of 5 - 8, Lund Mackay CT scoring system along with grade II or grade III in DNS also similar finding were noted by Bhattacharyya et al [13].



Graph 1: Showed sex wise distribution of cases.



Graph 2: Showed age wise distribution of cases.



Graph 3: symptoms wise distribution of cases.

DISCUSSION AND CONCLUSION

DNS is the principal reason for sinusitis. Patient suffering from CRS the clinical laboratory data from the study cases were recorded as proforma. The study included patient of varied age group and varied socio-economic status of both sexes. The results were then compared with available literature. The commonest sinus involved was the maxillary sinus seen in all cases.

The present study inclusions of 50 patients were who fulfilled the CRS criteria. Following conclusion can be drawn from the present study CRS affected persons of young age with maximum number of patients in their 3rd to 4th decade. CRS of these region showed a female predominance with a M:F ratio of 1:1.7 majorities of the CRS patients have CT scan Lund-Mackay score between 5 – 12. Grade II DNS along with abnormalities of OMC is the key factor of CRS in majority of cases.

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