

A HOSPITAL BASED COMPARATIVE STUDY OF DIAGNOSTIC NASAL ENDOSCOPY AND CT NOSE & PNS FOR EVALUATION OF CHRONIC RHINOSINUSITIS AT TERTIARY CARE CENTER

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Abstract

Background: The diagnosis of chronic rhinosinusitis (CRS) for a long time has been based on clinical history of the nasal disease and physical examination alone. The CT scan is considered as a gold standard diagnostic test for CRS. This study has been done to evaluate the role of nasal endoscopy and computed tomography scan in diagnosis of CRS, irrespective of further treatment. **Materials and Methods:** A hospital based prospective study done on 50 patients presenting with clinically diagnosed CRS in the department of Otorhinolaryngology and Head & Neck surgery, TRIHMS, Arunachal Pradesh, India during one year study period. Socio-demographic data were collected from all the participants by using a proforma. The participants were given a course of antibiotics and antihistamines for a period of 10 days prior to CT scan and within an interval of 5 days DNE was performed. The outcome from both methods was recorded and measured. Statistical analysis was performed by using SPSS software. **Results:** Our study showed that the mean age of patients was 34.3 years. The male to female ratio was 1:1. The Haller cells and sphenoidal air cells could visualize only in CT, where the accessory maxillary ostium was visualized only in DNE. Both CT and Endoscopy are found equally effective for the diagnosis of nasal septal deviation in our study. There was a difference in the observations on frontal recess patency in DNE and CT. In DNE we found that 44% of patients have enlarged middle turbinate whereas in CT it is 54%. **Conclusion:** Diagnostic nasal endoscopy aids in the diagnosis and CT PNS shows us roadmap of management of sino-nasal diseases. It is an adjuvant to management instead of replacement.

INTRODUCTION

Chronic Rhinosinusitis (CRS) is a chronic inflammation of nasal & paranasal sinus mucosa that affects the quality of life and causes considerable treatment costs.^[1]

According to National Institute of Allergy and Infectious Diseases (NIAID), 134 million Indians suffer from Chronic Rhinosinusitis.^[2]

The European Academy of Allergology and Clinical Immunology (EAACI) defines chronic rhinosinusitis (CRS) as nasal congestion or blockage lasting for more than 12 weeks with Facial pain or fullness and/or purulent nasal discharge or post-nasal drip or hyposmia. The diagnosis of CRS for a long time has been based on clinical history of the nasal disease and physical examination alone. However, many

complementary tests are required to come to the final diagnosis. The advent of the nasal endoscope has emphasized the importance of nasal endoscopy in CRS and imaging of the nose and paranasal sinuses have complemented the evaluation of diseases of the nose and paranasal sinuses.^[3] Routine use of a nasal endoscope and computed tomographic scanning (CT scan) of the nose and paranasal sinuses has opened new vistas in peeping into the inaccessible areas and niches of fronto-ethmoidal complex, sphenoidal recess and sphenoid sinuses. Nasal endoscopy may help to identify the small lesions or anatomical variation which is undetected clinically or conventional radiography. It is always necessary to have a more objective methodology or investigative protocol for précised diagnosis and decision making.

The CT scan is considered as a gold standard diagnostic test for CRS.^[4,5] It helps to assess the extent of the disease, any anatomical variants and relationships of the sinuses and turbinates with surrounding vital structures. However, performing CT scan just to confirm CRS unnecessarily increases the risk of exposure to ionizing radiation, also adds cost of procedure.^[6] Messerklinger developed a systemic endoscopic approach for diagnosis and treatment of CRS. Cold light nasal endoscopy along with computed tomographic scanning (CT scan) has led to opening of new scope to access the hidden areas of fronto- ethmoid complex and sphenoid sinus. DNE is a very simple office procedure which is usually done under topical anaesthesia either in sitting or supine position with the help of 0 degree & 30 degree 4mm endoscope.

This study has been done to evaluate the role of nasal endoscopy and computed tomography scan in diagnosis of CRS, irrespective of further treatment.

MATERIALS AND METHODS

A hospital based prospective study done on 50 patients presenting with clinically diagnosed CRS in the department of Otorhinolaryngology and Head & Neck surgery, TRIHMS, Arunachal Pradesh, India during one year study period. Informed consent was taken from each participant in the study.

Inclusion: Patient with following presentation (> 12 weeks)

- Chronic headache.
- Facial pain or fullness.
- Purulent or mucopurulent nasal discharge.
- Nasal obstruction.
- Post nasal drip.
- Decrease or loss of smell.

Exclusion

- Patient refuses for diagnostic nasal endoscopy.
- Diagnosed cases of Migraine and Pulsatile headache.
- Patients who have undergone nasal or sinus surgery.
- Patients with tumor of nose and paranasal sinuses.
- Patients with acute sinusitis.
- Patients with autoimmune disorders or immune compromised patients.

- Pregnancy.

Methodology: Socio-demographic data were collected from all the participants by using a proforma. The participants were given a course of antibiotics and antihistamines for a period of 10 days prior to CT scan and within an interval of 5days DNE was performed. Topical decongestant with lignocaine 4% solution was used for topical anaesthesia and the procedure was carried out by using 0 degree & 30 degree 4mm Karl Storz Hopkin's rod lens telescope with standard three pass techniques as per the standard procedure.^[7] Disease is diagnosed by presence of one or more of the followings:

- Mucopurulent discharge in the middle meatus or ethmoid region.
- Oedema or polypoidal changes in the middle meatus and/or ethmoid region.
- Polyp in the nasal cavity or middle meatus.

After nasal endoscopy, CT nose & PNS was done with 4mm cuts and evaluated thoroughly. The outcome from both methods was recorded and measured. Statistical analysis was performed by using SPSS software (Version 21.0).

RESULTS

Our study showed that 44% of cases were in 31-40 years of age group. The mean age of patients was 34.3 years [Table 1]. The male to female ratio was 1:1. [Table 2] shows the comparative findings in CT and DNE of the nasal cavity. The Haller cells and sphenoidal air cells could visualize only in CT, where the accessory maxillary ostium was visualized only in DNE. Both CT and Endoscopy are found equally effective for the diagnosis of nasal septal deviation in our study. The polypoidal and hypertrophied uncinate process could better visualize in DNE. Secretions in the middle meatus was seen in 36% cases in DNE. The CT scan could not give a clear picture regarding the secretions in the middle meatus. There was a difference in the observations on frontal recess patency in DNE and CT. In DNE we found that 44% of patients have enlarged middle turbinate whereas in CT it is 54%. The incidence of inferior turbinate hypertrophy was also differently noted in DNE and CT [Table 2].

Table 1: Distribution of patients according to age groups (yrs)

Age group (years)	Frequency	Percent (%)
0 to 20	12	24
21 to 30	10	20
31 to 40	22	44
41 to 50	3	6
51 to 60	3	6
Total	50	100.0

Table 2: Comparative findings in CT and DNE of nasal cavity.

Findings	Diagnostic nasal endoscopy	Computed tomography findings
Deviated nasal septum	44	42
Middle meatus	Polyp	02
	Secretions	4

Frontal recess patency	Mucosal thickening	NV	9
	Hypo-plastic	NV	2
Maxillary sinus	Bony septum (Underwood's septa)	NV	2
	Retention cyst	NV	9
Agger nasi		0	0
Haller or infraorbital cells		NV	4
Sphenoid (mucosal Thickening)		NV	14
Accessory maxillary ostium presence		1	1
Uncinate process	Hypertrophy	03	0
	Polypoidal	2	0
Middle turbinate	Paradoxical	3	3
	Concha Bullosa/ hypertrophy	22	27
Inferior turbinate	Hypertrophy	22	15
	Polypoidal	02	0
	Atrophy	02	02

DISCUSSION

Nasal Endoscopy and computerized tomography (CT) have revolutionized the understanding and management of sino-nasal disease. Diseases of para nasal sinuses are evaluated by combination of the DNE and CT PNS. Computed tomography (CT) scan has the ability to detect mucosal disease and anatomical variations, to demonstrate a primary obstructive pathology and to visualise posterior ethmoid, sphenoid sinuses and thus helps in the management of CRS.

In this study we found that majority of the patients affected were belongs to the age group between 21 to 30 years and we could infer that this age group is more exposed to the environment and recurrent upper respiratory tract infections. Among the study population, 50% of the patients were males and the findings were at par with the findings of Goutam et al.^[8]

The septal deviation was one of the most common anatomical variations observed in both CT and DNE in our study. Similar findings were observed in a study conducted by Shahizon et al in 40 patients. They observed that 41% cases show septal deviation in CT scan and 25% cases in DNE. However, the study population was less than the current study population.^[9]

In the study conducted by Patel et al could not visualize the mucopurulent secretions in the middle meatus and it was seen in DNE.^[10] From this study, it is clear that middle meatal secretions cannot be visualized with CT scan; DNE is required to assess meatal secretions and mucosal changes.

Frontal recess patency was clearly visualized in both CT and maxillary ostium patency were clearly visualized in both CT and DNE. In the study conducted by Sheetal et al 65% cases showed the frontal recess patency in CT scan 63% cases in DNE.^[11] In a different study conducted by Zojaji et al found that maxillary sinus patency in 62.7% on right and 64.7% on left in CT and 68.6% on both rights and left in DNE.^[12]

A similar study conducted by Talaipour et al. Out of 143 cases CT scan showed Onodi cells in 7% cases. By comparing both studies, our study had a significant reduction in a number of cases with Onodi cells. The accessory maxillary ostium, middle

turbinate concha bullosa and paradoxical turbinate had different findings in DNE and CT.^[13]

The condition of mucosa whether it is pale, congested or edematous could be clearly detected with DNE whereas CT scan could not detect mucosal changes in our study. Whereas in the study conducted by Naghibi et al observed that both CT and DNE were useful to identify the inferior turbinate hypertrophy. The current study also identified that DNE is more accurate for detecting mild polyposis and CT scan detect only extensive polyposis.^[12] In the study conducted by Duarte, et al a number of nasal polyposis were evidenced in DNE but not in CT.^[14] Evidence from both studies indicates that nasal polyps are visualized more in DNE when compared to CT. In our study, we noted that Sinus haziness could visualize only with CT scan and not with DNE. The findings are at par with the findings of Sheetal et al.^[11]

Nasal endoscopy helps in evaluation of the osteomeatal complex for evidence of the disease and to detect anatomical defects that compromise ventilation and mucociliary clearance. Hence nasal endoscopy and CT have brought the revolution in understanding CRS. The CT scan is considered as a gold standard diagnostic test for CRS.^[5,6] but performing CT scan just to confirm CRS preoperatively unnecessarily increases the risk of exposure to ionizing radiation, also adds cost of procedure.^[7] Hence this study was undertaken to evaluate whether nasal endoscopy can help in reducing rate of CT in diagnosis of CRS and can be advised only in specific patients.

CONCLUSION

Although Computed Tomography scan is gold standard in process of diagnosis of nasal pathologies; Diagnostic nasal endoscopy aids in the diagnosis and CT PNS shows us roadmap of management of sino-nasal diseases. It is an adjuvant to management instead of replacement.

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