



ORIGINAL RESEARCH PAPER

Otolaryngology

COMPARATIVE STUDY OF DIAGNOSTIC NASAL ENDOSCOPY AND CT PARANASAL SINUSES IN DIAGNOSING CHRONIC RHINO SINUSITIS

KEY WORDS: chronic rhinosinusitis (CRS), paranasal sinus CT scan, nasal endoscopy

Dr.Zafar Saleem

MS Otorhinolaryngology Assistant Professor, Department of ENT, Career Institute of Medical Sciences and Hospital, Lucknow.

Dr.Rehan Ahmad*

MD Radio diagnosis Associate Professor, Department of Radiology, Career Institute of Medical Sciences and Hospital, Lucknow. Corresponding Author

ABSTRACT

Background: Rhinosinusitis is a broad diagnostic term that encompass a spectrum of disorders involving concurrent inflammation of the mucosa of the nose and paranasal sinuses. There is an enormous economic burden of chronic rhinosinusitis (CRS), there is also significant patient morbidity in terms of quality of life and decreased overall productivity caused by CRS as measured by various studies.

Objectives: This study was designed to evaluate the accuracy of objective diagnostic modality, nasal endoscopy and to compare it with gold standard diagnostic modality, sinus CT scan.

Material and Methods: It was a prospective diagnostic cohort study in the department of otorhinolaryngology, Career Institute of Medical Sciences and Hospital, with the approval of ethical committee. Over a period of 1 year (June 2016 to May 2017) 50 adult patients attending ENT outpatient department, who were clinically diagnosed as CRS on the basis of detailed history and clinical examination and not responding to 12 weeks of medical treatment were included in the study.

Results: In this study, 42 cases showed anatomical variations out of 50 cases (ranging from 2.3% to 57.1%). The prevalence of Deviations of nasal septum was most common. Mixed Symptoms and Mixed Signs were most commonly observed in study, Incidence of Symptoms ranged from 20% to 90% and Signs ranged from 10% to 90%. More than one sinus bilaterally involved (68%).

Conclusion: If a patient meets guideline symptom criteria and has positive endoscopic findings on examination, it would be reasonable to treat with a clinically presumed diagnosis of CRS before obtaining a paranasal sinus CT scan. Sinus imaging could then be considered for those patients with refractory symptoms despite maximal therapy and in those cases where surgery is being planned.

Introduction:

Study by the National Institute of Allergy and Infectious Diseases (NIAID) recently conclude that 134 million Indians suffer from chronic rhinosinusitis, which is more than double the number of diabetic patients in India, having great personal and economic impact. Beside the enormous economic burden of chronic rhinosinusitis (CRS), there is also significant patient morbidity in terms of quality of life and decreased overall productivity caused by CRS as measured by various studies [6, 7].

Rhinosinusitis is a broad diagnostic term that encompass a spectrum of disorders involving concurrent inflammation of the mucosa of the nose and paranasal sinuses [1, 2]. Past attempts at defining rhinosinusitis have been purely symptom based. Approximately 87 % of visits for the diagnosis and management of rhinosinusitis are in the primary care setting where nasal endoscopy and computed tomography (CT) imaging are not routinely used for diagnosis. Consequently, a variety of national and international consensus meetings have developed symptombased definitions for the initial diagnosis of rhinosinusitis [3–5].

For reaching towards a proper diagnosis and management of CRS, in 2007, new guidelines for rhinosinusitis, from a multidisciplinary panel commissioned by American Academy of Otolaryngology-Head and Neck surgery, were published. The 12 major and minor symptoms of CRS were narrowed to four specific symptoms, and documentation of middle meatal inflammation was added to the diagnostic criteria for CRS in the hopes that objective data would improve diagnostic accuracy [3, 7].

Twelve weeks or longer of two or more of the following signs and symptoms:

- mucopurulent drainage (anterior, posterior, or both);
- nasal obstruction (congestion);
- facial pain-pressure-fullness; or
- decreased sense of smell.

Furthermore, an objective measure was required for the diagnosis of CRS: Inflammation documented by one or more of the

following findings:

purulent (not clear) mucus or edema in the middle meatus or ethmoid region;

polyps in nasal cavity or the middle meatus; and/or radiographic imaging demonstrating inflammation of the paranasal sinuses.

Aim and Objectives:

This study was designed to evaluate the accuracy of objective diagnostic modality, namely nasal endoscopy and to compare it with gold standard diagnostic modality namely sinus CT scan.

Material and Methods:

It was a prospective diagnostic cohort study in the department of otorhinolaryngology, Career Institute of Medical Sciences and Hospital, with the approval of ethical committee. Over a period of 1 year (June 2016 to May 2017) 50 adult patients attending ENT outpatient department, who were clinically diagnosed as CRS on the basis of detailed history and clinical examination and not responding to 12 weeks of medical treatment and suffering from at least 2 of the following symptoms (According to criteria as described by AAO-HNS 2007) [7], Nasal obstruction, Anterior and/or posterior nasal discharge, Headache/facial pains and/or Abnormalities of smell were included in the study. Subjects less than 10 years of age, those with history of previous sinonasal surgery, sinonasal malignancy, Cystic fibrosis, autoimmune disease, suffering from immunocompromised disorders, and Patients who declined to participate were excluded from the study. Subjects were evaluated by using the presence of two or more symptoms, nasal endoscopy, and paranasal sinus computed tomography (CT).

A detailed clinical history was taken and complete Ear, Nose, Throat, and Head and Neck examination. All hematological investigations, X-ray paranasal sinuses (water's view), CT scan of paranasal sinuses (coronal section with 3mm cuts at OMC) and Diagnostic Nasal Endoscopic examination (DNE): polyps/ discharge /edematous mucosa in middle meatus.

Diagnostic Nasal Endoscopic Examination: Procedure

- Decongestant and anesthetic spray is usually applied to allow full examination of the nasal cavity.
- In nasal endoscopy examination we look for nasal mucosa status (allergic, edema, polyps, crusting), Vestibule, Nasal valve, septum, Inferior turbinate and meatus, Middle turbinate and meatus, hiatus semilunaris, Olfactory groove, Sphenoethmoidal recess, superior turbinate and sphenoid ostium, Choanae and nasopharynx.

Results:

In this study, 42 cases showed anatomical variations out of 50 cases (ranging from 2.3% to 57.1%). The prevalence of Deviations of nasal septum was most common (Table – 1). Mixed Symptoms and Mixed Signs were most commonly observed in study, Incidence of Symptoms ranged from 20% to 90% and Signs ranged from 10% to 90% (Table – 2). More than one sinus bilaterally involved (68%) as per Table - 3.

Table 1: Anatomical variations

Anatomical Variation	Incidence	%
DNS	24/42	57.1
CB	7/42	16.6
Paradoxical MT	2/42	4.7
Double Middle Turbinate	2/42	4.7
Accessory ostium	3/42	7.1
Haller Cell	2/42	4.7
Onidi Cell	1/42	2.3
Prominent agger nasi	1/42	2.3

Table 2: Signs and symptoms of CRS in study

Symptoms	Incidence	%
Nasal Obstruction	22/50	44
Head Ache	10/50	20
Nasal Discharge	18/50	36
Mixed Symptoms	45/50	90
Signs		
MPD	15/50	30
Polypoidal changes	16/50	32
PND	5/50	10
Sinus Tenderness	14/50	28
Mixed Signs	45/50	90

Table 3: Involvement of Para nasal sinuses

CT Scan PNS/PNS	Incidence	%
1 Sinus Involved	6/50	12
>1 Sinus U/L	10/50	20
> 1 B/L Sinus	34/50	68

Discussion:

Rhinosinusitis is an extremely prevalent disorder that has a significant impact on the quality of life of affected individuals. Symptoms lasting longer than 12 weeks are classified as chronic. Fewer than 2% of colds in adults and up to 30% of colds in children progress to bacterial RS. The causes of chronic rhinosinusitis are multiple and include infectious (viral, bacterial, and fungal), allergic, anatomic, mucociliary, (e.g., cystic fibrosis, primary or acquired ciliary dyskinesia), and systemic disorders. In chronic sinusitis anatomical variations in nose and paranasal sinuses are common and these variations must be noted in order to attain a full understanding of pathogenesis and accurate diagnosis of chronic sinusitis.

A total of 50 cases were taken and their various anatomical factors, pathophysiology different variations of lateral wall of nose leading to osteomeatal complex block and their clinical features were studied. The appropriate investigations required for these cases were done & were treated surgically by endoscopic approach. The findings obtained are subjected to comparison with the observation available in the literature.

Improvements in functional endoscopic sinus surgery (FESS) and

computed tomography (CT) have concurrently increased interest in the anatomy of the paranasal region. The maxillary sinus was most commonly involved, followed by the anterior ethmoid, frontal sinus, posterior ethmoid and sphenoid sinus. Statistically significant association was found between the presence of common anatomic variations – septal deviation, bilateral concha bullosa, medial deviation of uncinat process, Haller cell, ethmoidal bulla hypertrophic, agger nasi cell – and the presence of sinus mucosal disease.

Anatomic variations of paranasal sinus structures may predispose patients to recurrent sinusitis and, in selected cases, to headache [3]. However, the relative importance of anatomic variations is still a matter of discussion and variable results have been reported [5]. Lerdlum, et al., and Stallman, et al. showed no specific association of anatomic variations in rhinosinusitis, and claimed that local, systemic, environmental factors or intrinsic mucosal disease were more significant in the pathogenesis of rhinosinusitis [6, 7].

Limitations:

As it is a single centre study with a relatively small study population, results cannot be generalized to the entire population.

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Conclusion:

In light of these findings, we propose that if a patient meets guideline symptom criteria and has positive endoscopic findings on examination, it would be reasonable to treat with a clinically presumed diagnosis of CRS before obtaining a paranasal sinus CT scan. Sinus imaging could then be considered for those patients with refractory symptoms despite maximal therapy and in those cases where surgery is being planned.

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