Section: ENT

Original Research Article

STUDY OF CLINICAL FEATURES AND NASAL ENDOSCOPY FINDINGS IN PATIENTS WITH RHINOSINUSITIS

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Received *: 09/09/2024*
Received in revised form *: 22/10/2024*
Accepted *: 07/11/2024*

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DOI: 10.70034/ijmedph.2024.4.196

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2024; 14 (4); 1067-1072

ABSTRACT

Background: This study aims to compare the efficacy of CT and nasal endoscopy findings for the evaluation of CRS in patients with persistent complaints despite appropriate medical therapy. **Aim:** To correlate the clinical features and nasal endoscopic features in the diagnosis of rhinosinusitis.

Material & Methods: The present study was conducted in the department of ENT, PES Institute of Medical Sciences & Research (PESIMSR), Kuppam, Andhra Pradesh, India. It was a Hospital-based Cross-sectional study, involved 88 participants studied for a period of 2 years from September 2019 to September 2021. Patients with symptoms of rhino sinusitis-Facial pain, headache, nasal obstruction, nasal discharge and decrease sense of smell.

Results: In the present study participants maximum of 36.4% were between 25-34 years of age and a minimum of 4.5% are among 55-64 years of age-group and the mean age was found to be 36.03±9.7yearsand lowest age of 16 years and the highest age recorded was 59years. Among the patient's maximum of 56.8% were having acute sinusitis followed by 11.4% sub-acute and 31.8% as the chronic type of sinusitis. A maximum of 54.5% had nasal obstruction followed by 53.4% with nasal discharge the least symptom was hyposmia or anosmia as 3.4%. Among the study participants maximum of 54.5% had a headache as a minor symptom followed by the heaviness of the head and the least were with lethargic symptoms. Maximum of 46.6% presented with excessive sneezing followed by postnasal drip and watering of the eye. On endoscopy, 63.6% of the participants had mucosal congestion and 36.4% had no mucosal congestion.51.1% had thin and clear mucosal discharge and 29.5% had thick purulent discharge and only 19.3% had no mucosal discharge. Among the study participants, it was found that a maximum of 37.5% of acute sinusitis had mucosal congestion followed by 20.5% of chronic sinusitis and least of 5.7% of sub-acute sinusitis patients had mucosal congestion compared to sub-acute and chronic sinusitis and the difference was found to be highly significant with P-value 0.01.

Conclusions: Nasal endoscopy has essential role in accurately diagnosing this pathology, which includes anatomical variations as well as polypoid changes in the mucosa. DNE is outpatient procedure, relatively economic with no radiation hazards, aids in early diagnosis and medical management of CRS.

Keywords: Chronic Rhinosinusitis, Computerised Tomography, Diagnostic Nasal Endoscopy.

INTRODUCTION

The term "sinusitis" describes an inflammation of paranasal sinuses that can have a viral, allergic, or bacterial origin. It is one of the most common conditions for which patients seek medical care. The most common cause is the common cold by viral infections which is self-limiting in most cases. When accompanied by a viral infection, it causes the mucosal inflammation of the nasal cavity and

paranasal sinuses resulting in alterations in the frequency of ciliary movement and mucous stasis. It predisposes to secondary bacterial infection of which most common include streptococcus pneumonia.[1] The duration of respiratory symptoms can be used to categorize patients who have sinusitis. Acute bacterial sinusitis (ABS) is defined by nasal and sinus symptoms that have been present at least 10days (in most cases) and less than 4weeks. Sub-acute sinusitis is defined by nasal and sinus symptoms lasting more than 4 weeks and less than 12 weeks. As there is no particular information comparing acute and sub-acute sinusitis, this ultimately proves to be an arbitrary distinction that does not affect etiology, diagnosis, or treatment. Chronic sinusitis is defined by symptoms of at least 12 weeks duration. Because the etiology of chronic sinusitis is often unknown, treatment of this condition is controversial.[2]

Symptoms affecting the upper respiratory tract infection are considered to be one of the greatest challenges to distinguish whether it's viral or bacterial and a complicating factor is both allergic and viral predispose patients to acute or chronic rhinosinusitis. Young children experience 6-8 viral upper respiratory infections per year of which 5-10% are estimated to be complicated by rhinosinusitis and in adolescence, the prevalence rate is almost around 20%. The physicians need to recognize both allergic and viral upper respiratory tract infections more than acute bacterial rhinosinusitis.[2]

There are four paired paranasal sinuses 1) frontal 2) ethmoidal 3) maxillary and 4) sphenoidal sinuses. The ethmoidal sinuses are further subdivided into anterior and posterior ethmoid sinuses by the basal lamella of the middle nasal concha. Hence sinusitis is classified by the sinus cavity it affects:

- Maxillary – cancause pain or pressure in the maxillary (cheek) area (e.g., toothache,[3] or headache)
- Frontal – can cause facial pressure or pain in the frontal sinus cavity and headache, particularly in the forehead.
- Ethmoidal – can cause pain or pressure pain between/behind the eyes, the sides of the upper part of the nose (the medial canthi), and headaches.[4] Sphenoidal – can cause pain or pressure behind the eyes, but is often felt in the top of the head, over the mastoid processes, or the back of the head.[4]

Prevalence of Rhinosinusitis

Overall, it affects 10-15% of adults especially the chronic rhinosinusitis effect on health-related quality of life and is associated with substantial health care and productivity cost. The prevalence of CRS without polys is 10.9% and with polyps is 2-4%. (5). An estimated 134 million Indians suffer from chronic sinusitis, the symptoms of which include but are not limited to debilitating headaches, fever, nasal congestion and nasal obstruction.[6] Among Indians, this disease is more widespread than diabetes, asthma, or coronary heart disease. One in eight Indians suffers from chronic sinusitis. It is caused by the inflammation of the nasal and throat lining, which results in the accumulation of mucus in the sinus cavity and pressure build-up in the face, eyes, and brain.[7]

CT scan provides the ability to accurately assess these areas for evidence of localized disease or for anatomical defects that compromise ventilation and mucociliary clearance. This allows the surgeon to individualize their surgical approach according to the extent and location of the disease studied on a CT scan of the nose and PNS. While CT delineates the extent of disease, defines any anatomical variants, and the relationship of the sinuses with the critical surrounding structures. The nasal endoscopy is inexpensive, easily incorporated into the routine examination and helps in monitoring the progress of sinus disease. Most authors state a significant correlation between DNE and CT scan findings of the nose and PNS.[18] Hence, in recent times, both DNE and CT scans of the nose and PNS have revolutionized the understanding and management of rhinosinusitis.

The purpose of this study was to determine the correlation between the symptoms and endoscopic findings.

Aims and Objectives

Aim: To correlate the clinical features and nasal endoscopic features in the diagnosis of rhinosinusitis.

Objectives

1. To study the socio-demographic profile.
2. To determine the frequency of clinical features with which the patient comes to the hospital.
3. To know the endoscopic findings of Rhinosinusitis on nasal endoscopy and to correlate with the clinical features.

MATERIALS AND METHODS

Study area

The present study was conducted in the department of ENT, PES Institute of Medical Sciences & Research (PESIMSR), Kuppam, Andhra Pradesh, India.

Study design

Hospital-based Cross-sectional study.

Study participants:

Individuals aged above 15 years up to 70 years

Inclusion Criteria

1. Patients aged 15 years and above up to 70yrs.
2. Patients who have given written informed consent.
3. Patients with symptoms of rhino sinusitis-Facial pain, headache, nasal obstruction, nasal discharge and decrease sense of smell.

Exclusion Criteria

1. Gross DNS with symptoms.
2. Nasal polyposis.

3. Patients with a history of nasal surgeries.
4. Nasal malignancies.
5. Patients who have not given consent.
6. Devastated and debilitated persons (mental illness, physical disability, medical illness).
7. Patients aged less than 15 years.

Sources of Data: There were 2 sources of data collected. First was the response from the subjects during the interview, second was the records of their own available.

Tools for data Collection

A questionnaire was designed for data collection after a systematic review of published studies. Validation of questionnaire was done after incorporation of the received inputs the questionnaire was pilot tested, thereafter further modifications were done. The questionnaire was initially designed in English and then it was translated into the local language (Telugu) with the help of a translator. The final version of the questionnaire consisted of 4 different parts

I. **Socio-demographic profile**.
II. **History of chief complaints, Present history and Past history**
III. **General examination and systemic examination**
IV. **Investigations- Diagnostic nasal endoscope (DNE).**

The questionnaire was pilot tested on a small sample (around10the % of the total sample) to check for the accuracy of responses and to estimate the time needed for the interview. During pilot testing, if we found anything which was either confusing or inconsistent with the objectives of the study then it was either modified or deleted.

Other tools required were Nasal packing with Inj. Xylocaine with adrenaline and 0degree Hopkins Rod endoscopy.

Data Collection

Before starting the interview, they were explained the purpose and objective of the study in the local language. Thereafter study participants were asked for written informed consent. From the patient detailed relevant clinical history regarding age, gender, occupation and clinical features like facial pain, headache, nasal discharge-watery, mucoid, purulent or blood mixed, nasal obstruction-either continuous or intermittent) will be obtained from the patient which was followed by Clinical examinations (general, systemic and ENT examination) was done with special emphasis on Anterior and posterior rhinoscopy. Nasal endoscopy was done using Hopkins rod endoscopy of 0 degrees after packing with 4% xylocaine with adrenaline. During the first pass, inferior turbinate, nasal cavity, septum and nasopharynx were examined. During the second pass, superior turbinate, sphenoethmoidal recess and sphenoid sinus ostium were visualized. During the third pass, the middle meatus region including the uncinate process, hiatus semilunaris, middle turbinate, bulla ethmoidalis, presence of any discharge/ polypoidal changes in middle meatus was noted. Nasal endoscopy findings were noted using the LundKennedy Endoscopic Scoring system to assess the following parameters: nasal mucosa oedema (absent = 0, mild-moderate = 1 or polypoid degeneration = 2), presence of secretion (absent = 0, hyaline = 1, thick and/or mucopurulent = 2) and presence of polyps (absent = 0, limited to the middle meatus = 1 or extended to the nasal cavity = 2). The assessment was performed bilaterally, with the total points corresponding to the sum of values obtained in both sides total score (2 was considered as positive)

Data Analysis

Completed questionnaires were cross-checked by study supervisors for completeness and accuracy of data before entering into the software. Before data entry responses were coded and thereafter data entry was done using Microsoft Excel version 2013. At a later stage, all the data was transferred to SPSS version 20.0 for statistical analysis. Descriptive summaries using frequencies, proportions, graphs and cross tabs were used to display study results. Data were tabulated in 2×2 contingency tables and statistical tests were applied. Probability (p) was calculated to test for statistical significance at a 5% level of significance. Association between various factors was determined using the Chi-Square test.

Ethical Consideration

The ethical clearance was obtained from the Institutional Ethical Committee of PES institute of medical sciences and research before commencing the study.

RESULTS

Among study participants, a maximum of 19.3% are females seen in the age group of 35-44years and a maximum of 20.5% are males seen in 25-34 years age group and the difference is not significant as the P-Value is 0.7. [Table 1]

Among the patient's maximum of 56.8% were having acute sinusitis followed by 11.4% sub-acute and 31.8% as the chronic type of sinusitis. [Table 2]

Among the participants maximum of 54.5% had nasal obstruction followed by 53.4% with nasal discharge and the least symptom was hyposmia or anosmia as 3.4%. [Table 3]

Among the study participants maximum of 54.5% had a headache as a minor symptom followed by the heaviness of the head and the least were with lethargic symptoms. [Table 4]

Among the study participants maximum of 46.6% presented with excessive sneezing followed by postnasal drip and watering of the eye. [Table 5]

Among the study participants when anterior Rhinoscopy was done it was found that 61.4% had mucosal congestion and 38.6% did not have mucosal congestion, 87.5% had no discharge and only 9.1% had thick mucopurulent discharge followed by 3.4% had a thin clear discharge. [Table 6]

Among the study participants, it was found that a maximum of 37.5% of acute sinusitis had mucosal congestion followed by 20.5% of chronic sinusitis and least of 5.7% of sub-acute sinusitis patients had mucosal congestion compared to sub-acute and chronic sinusitis and the difference was found to be highly significant with P-value 0.01. [Table 8]

Regarding the mucosal oedema maximum of 56.8% of acute sinusitis patients had no mucosal oedema followed by sub-acute with 11.4% and chronic with6.8%. In chronic sinusitis 5.7% had moderate mucosal edema, 6.8% had moderate mucosal edema with polypoidal changes, 1.13% had severe mucosal edema, 4.5% had severe mucosal edema with polypoidal changes, 6.8% had severe mucosal edema with polyps in comparison to acute and sub-acute sinusitis and the difference was found to be significant with P-value as 0.02.

Regarding the discharge, it was found that among the patients with acute sinusitis 28.4% had thick purulent discharge and 27.3% had thin clear discharge and only 1.1% had no discharge compared to sub-acute and chronic sinusitis and this difference was found to be very significant with P-value 0.0001. [Table 9]

Table 1: Distribution according to Age and Gender

Age	Females	Males	Total
15-24 years	5(5.7%)	4(4.5%)	9(10.2%)
25-34years	14(15.9%)	18(20.5%)	32(36.4%)
35-44 years	17(19.3%)	14(15.9%)	31(35.2%)
45-54 years	8(9.1%)	4(4.5%)	12(13.6%)
>55years	2(2.3%)	2(2.3%)	4(4.6%)
Total	46(52.3%)	42(47.7%)	88(100%)

Table 2: Distribution of participants according to the type of sinusitis

Type of sinusitis	Frequency	Percentage
Acute	50	56.8%
Sub-acute	10	11.4%
Chronic	28	31.8%
Total	88	100%

Table 3: Distribution of participants according to major symptoms

Major symptoms	Frequency	Percentage
Nasal obstruction	48	54.5%
Nasal discharge	47	53.4%
Facial pain	23	26.1%
Hyposmia/Anosmia	3	3.4%
Fever	26	29.5%

Table 4: Distribution of participants according to minor symptoms

Minor symptoms	Frequency	Percentage
Headache	48	54.5%
Heaviness of head	44	50%
Halitosis	11	12.5%
Lethargy	5	5.7%
Aural fullness/pain	10	11.4%

Table 5: Distribution of participants according to allergic symptoms

Allergic symptoms	Frequency	Percentage
Excessive sneezing	41	46.6%
Watering of eye	17	19.3%
Postnasal drip	28	31.8%

Table 7: Distribution of participants according to Anterior Rhinoscopy findings

RHINOSCOPY	FREQUENCY	PERCENTAGE
CONGESTION		
Absent	34	38.6%
Present	54	61.4%
DISCHARGE		
Absent	77	87.5%
Thin clear	3	3.4%
Thick Mucopurulent	8	9.1%
INFERIOR TURBINATE HYPERTROPHY		
Absent	70	79.5%
Right	9	10.2%
Left	6	6.8%
Bilateral	3	3.4%

Table 8: Distribution according to endoscopic findings and type of sinusitis

ENDOSCOPIC FINDINGS	ACUTE	SUBACUTE	CHRONIC	TOTAL	P Value
MUCOSAL CONGESTION					
Absent	17(19.3%)	5(5.7%)	10(11.4%)	32(36.4%)	0.01
Present	33(37.5%)	5(5.7%)	18(20.5%)	56(63.6%)	
Total					
MUCOSAL EDEMA					P value
Absent	50(56.8%)	10	6	66(75%)	
Moderate	0	0	5(5.7%)	5(5.7%)	
With polypoidal changes	0	0	6(6.8%)	6(6.8%)	
With polyps	0	0	0	0	
Severe	0	0	1(1.13%)	1(1.13%)	0.02
With polypoidal changes	0	0	4(4.5%)	4(4.5%)	
With polyps	0	0	6(6.8%)	6(6.8%)	
Total	50(56.8%)	10(11.4%)	28(31.8%)	88(100%)	
DISCHARGE					P Value
Absent	1(1.1%)	2(2.3%)	14(15.9%)	17(19.3%)	
Thin clear	24(27.3%)	8(9.1%)	13(14.8%)	45(51.1%)	
Thick purulent	25(28.4%)	0	1(1.1%)	26(29.5%)	0.0001
Total	50(56.8%)	10(11.4%)	28(31.8%)	88(100%)	

DISCUSSION

The dissertation titled "Study of Clinical features and nasal endoscopy findings in patients with rhinosinusitis" helps us to know the frequent clinical features with which the patient comes along with the nasal diagnostic endoscopic findings which enable us to take the correct decision in the management of patients.

Rhinosinusitis is a common disease that is increasing worldwide. Though the diagnosis is symptom-based and American academy of otolaryngology taskforce on laryngology (AAOL) recommends nasal endoscopy and CT scan of the nose and PNS for accurate diagnosis and effective management of the disease.

According to age

According to this study, it was found that among the study participants maximum of 36.4% were between 25-34 years of age and a minimum of 4.5% are among 55-64 years of age-group and the mean age was found to be 36.03±9.7yearsand lowest age of 16 years and highest age recorded was 59years. Vanitha Brindha Baba Caliaperoumal et al,[8] in their study on Correlation of Clinical Symptoms with Nasal Endoscopy and Radiological Findings in the Diagnosis of Chronic Rhinosinusitis: A Prospective Observational Study found out that among the 70 participants who were included in the study, most of the patients were between the age group of 21 to 60 years with the mean age group of the study population being 42.6±13.45 years which was almost similar to the present study.

According to symptoms:

According to this study, it was found that a maximum of 54.5% and 53.4% had come with nasal obstruction and nasal discharge. Vanitha Brindha Baba Caliaperoumal et al 8 in their study observed that the most predominant symptoms are nasal obstruction and nasal discharge in almost all the enrolled cases which were very similar to the present study. Nayak et al. and Deosthale et al,[9] in their studies found similar results According to symptoms; According to this study, it was found that a maximum of 54.5% and 53.4% had come with nasal obstruction and nasal discharge. Vanitha Brindha Baba Caliaperoumal et al in their study observed that the most predominant symptoms are nasal obstruction and nasal discharge in almost all the enrolled cases which were very similar to the present study. Nayak et al. and Deosthale et al,[9] in their studies found similar results.

According to anterior Rhinoscopy & Nasal endoscopic findings

In the present study on anterior rhinoscopy, it was found that a maximum of 61.4% had mucosal congestion and 38.6% without congestion, 87.5% had no discharge and 9.1% had thick mucopurulent discharge followed by 3.4% with thin clear discharge,79.5% had no inferior turbinate hypertrophy and only 10.2% had inferior turbinate hypertrophy on the right side followed by 6.8% on the left side and only 3.4% had bilaterally.

According to present study on endoscopy, 63.6% of the participants, 36.4% had no mucosal congestion, 37.5% of acute sinusitis had mucosal congestion followed by 20.5% of chronic sinusitis and least of 5.7% of sub-acute sinusitis had mucosal congestion compared to sub-acute and chronic sinusitis and the difference was found to be highly significant with P-value 0.01.

Regarding the mucosal oedema, it was found that 75% had no mucosal oedema and 5.7% had moderate mucosal edema, 6.8% had moderate polypoidal changes followed by 6.8% with severe mucosal oedema with polyps and 4.5% had severe mucosal oedema with polypoidal changes and none of them had moderate oedema with polyps.

Regarding the mucosal oedema maximum of 56.8% of acute sinusitis patients had no mucosal oedema

followed by sub-acute with 11.4% and chronic with 6.8%. In chronic sinusitis 5.7% had moderate mucosal edema, 6.8% had moderate mucosal edema with polypoidal changes, 1.13% had severe mucosal edema, 4.5% had severe mucosal edema with polypoidal changes, 6.8% had severe mucosal edema with polyps in comparison to acute and sub-acute sinusitis and the difference was found to be significant with P-value as 0.02.

Stephanie Dharmaputri et al,[10] according to nasal endoscopy results, nasal discharge and oedema were found in most of the patients (68.8% and 63.0%), but nasal polyp was only found in 15.9% of patients. Other findings such as hypertrophy concha or nasal septum deviation were also found on 87.7% of patients. Therefore, they have concluded that most of the rhinosinusitis patients are found with at least one of the following results of nasal endoscopy, which are nasal discharge, oedema, or nasal polyp.

Limitation of the study

- The use of a cross-sectional survey to collect data may have underestimated the true signs and symptoms
- The main limitations of the study were the sample size which is small and the results cannot be generalized.

CONCLUSION

The study concluded that Diagnostic nasal endoscopy is a good predictor of sinus disease to confirm the diagnosis and to know the severity of the disease. This can help the initiation of medical management. It can aid in concluding which patient exactly needs surgical treatment rather than medical treatment.

Conflict of Interest: None
Funding Support: Nil.

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