Comparative evaluation of nasal endoscopy and computed tomography scan in cases of chronic rhinosinusitis

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INTRODUCTION

The pathophysiology of chronic rhinosinusitis (CRS), a chronic inflammation of the nasal and paranasal sinus, cavity is poorly described. The symptomatology of CRS depends on the severity and duration of disease. Computed tomography (CT) scan and diagnostic nasal endoscopy (NE) help to explore the hidden areas of nose and paranasal sinuses and help in diagnosing the condition.

Normal osteomeatal complex is most important for proper functioning of paraneoplastic neurological syndromes commonly affected by anatomical variations which compromise ventilation and mucociliary clearance of nose and paranasal sinuses.

NE allows visualization of pathology in postnasal space, middle, and superior meatus which cannot be appreciated on anterior rhinoscopy. The main advantage of CT scan is that it can demonstrate soft tissue shadows and fluid in the sinuses, but confirmation should be done with NE.

The aim and objective of the study is to evaluate the results of NE and CT scan in cases of CRS.

MATERIALS AND METHODS

This study was carried out in the Department of Otorhinolaryngology and Head and Neck Surgery, Rohilkhand Medical College and Hospital, Bareilly, from October 2016 to September 2017.
A total of 124 patients of CRS who did not respond to 3 weeks of medical treatment were enrolled for the study.

A thorough history and complete examination were done and based on these findings, a clinical diagnosis of CRS was made and all these cases underwent radiological and endoscopic evaluation.

Plain CT scan and NE of nose and paranasal sinuses were done in all cases. A 1–3 mm cuts were obtained both in coronal and axial plain. The evaluation was done, especially to look for discharge, mucosal thickening, cyst, polyp/antronal mass in nose, and paranasal sinuses.

RESULTS

A total number of 124 patients, 76 males and 48 females, suffering from CRS in the age group of 10–70 years have been evaluated.

The patients were diagnosed on the basis of major and minor criteria for CRS as per the protocol of either two major or one major and one minor symptoms, Table 1.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Number of patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facial pain/pressure</td>
<td>21</td>
<td>16.94</td>
</tr>
<tr>
<td>Nasal obstruction</td>
<td>92</td>
<td>74.19</td>
</tr>
<tr>
<td>Nasal discharge</td>
<td>60</td>
<td>48.39</td>
</tr>
<tr>
<td>Hyposmia</td>
<td>40</td>
<td>32.26</td>
</tr>
<tr>
<td>Minor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headache</td>
<td>42</td>
<td>33.87</td>
</tr>
<tr>
<td>Halitosis</td>
<td>10</td>
<td>8.06</td>
</tr>
<tr>
<td>Fatigue</td>
<td>10</td>
<td>8.06</td>
</tr>
<tr>
<td>Dental pain</td>
<td>35</td>
<td>28.23</td>
</tr>
<tr>
<td>Cough</td>
<td>30</td>
<td>24.19</td>
</tr>
<tr>
<td>Earache pressure</td>
<td>5</td>
<td>4.03</td>
</tr>
</tbody>
</table>

CRS: Chronic rhinosinusitis

Out of 124 patients, among major symptoms, maximum patients were having nasal obstruction (74.19%), and among minor symptoms, headache was in 33.83% of patients.

All the patients were subjected to CT scan and diagnostic NE [Table 2].

Mucosal thickening was picked up by both CT scan and endoscopy in 96.77% of cases, whereas CT scan could not diagnose discharge in a majority of cases, which was picked up by endoscopy. For other conditions such as nasal polyp and hypertrophied turbinates, the result was comparable between the two.

DISCUSSION

Sinonasal diseases are the most commonly encountered problems in day-to-day rhinological practice. CRS encompasses a range of indolent and insidious conditions which makes it hard to diagnose accurately and even harder to provide a completely satisfactory treatment modality. The incidence of CRS has been reported to be between 5 and 15% globally. Although the identification of CRS is based on symptoms, signs, and clinical examination, yet radiological assessment of the extent of disease is of paramount importance. Variations in intranasal and sinus...
Nasal endoscopy and CT scan

Vashisth et al. included facial pain in 16.94% of cases and hyposmia/anosmia in about 32.26% of cases. Important minor symptoms were headache in 33.87% of cases followed by dental pain in 28.23% of cases and cough in 24.19% of cases. Dental pain might be due to chronic maxillary sinus infection and cough due to postnasal discharge.

All patients underwent CT scan of paranasal sinuses (1–3 mm cuts) both in coronal and axial plane and NE. CT scan diagnosed mucosal thickness in 77.42%, turbinate hypertrophy 77.48% [Figure 1], and DNS in 64.52% of cases, whereas endoscopic examination was also of almost same sensitivity as CT scan.

On comparative evaluation of the findings of CT scan and NE, CT scan could pick up discharge in maxillary sinuses in 3.23% of cases, whereas endoscopy showed discharge in sinuses in 58.06% of cases. It is inferred that CT scan could not pick up discharge as well as endoscopy [Figures 2-4].

In the present study, CT scan and endoscopy could pick up mucosal thickening in 96.77% of cases. Nasal mass/polyp in anatomy have been implicated in the etiology and the course of chronic and recurrent sinusitis.

The present study has been undertaken to compare the role of endoscopy and CT scan in cases of CRS. A total of 124 patients suffering from CRS were included in the study. CT scan and nasosinus endoscopy were conducted in all patients and results were recorded and analyzed.

Most of the patients in the present study were found to be in the age group of 31–50 years (43.55%) and majority of them were male (61.29%).

The advent of CT scan has revolutionized the diagnosis and management of the diseases of the nose and sinuses. CT scan has been a great aid as an accompaniment of FESS.

In the present study, out of major symptoms, 74.19% of patients on presentation had nasal obstruction followed by nasal discharge in 48.39% of patients, indicating the fact that most of the chronic diseases of nose and paranasal sinuses develop some degree of infection. Other important clinical symptomatologies included facial pain in 16.94% of cases and hyposmia/anosmia in about 32.26% of cases.

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maxillary sinus was far more frequently detected on CT scan in 45.16% of cases and endoscopy in 48.39%.

When endoscopy was considered individually, discharge in maxillary sinus was a very frequent finding in 58.06% of cases. Discharge present in the sinus is indicative of a low-grade inflammation and poor sinus drainage both of which contribute to the slow indolent course of the sinus disease. Endoscopy not only facilitates the diagnosis of the presence of discharge, but it is also possible to characterize the nature of discharge as well. This was because the thick well-formed secretions were misdiagnosed to be a cyst/antral polyp on CT, but only discharge was found during endoscopy in some cases. Mucosal thickening was picked up in 96.77% of cases by CT scan and endoscopy. Antral polyp was confirmed by CT and endoscopy in 12.90% of cases. Nasal mass/polyp was picked up in 45.16% by CT and 48.39% by endoscopy. There was no significant difference between these modalities in diagnosis of hypertrophied turbinates and DNS.

It is observed that CT was far more accurate in detecting mucosal changes. This is important because many studies have reported that the amount of mucosal thickening may not correlate well with symptoms of the patients. Frequently disproportionately severe symptoms are seen in patients when mucosal changes are subtle. At the same time, relatively asymptomatic individuals are seen with severe mucosal changes. Hence, it is imperative for the surgeon to evaluate CT findings with reference to symptoms so as to provide maximum symptomatic relief to the patient. There was a high correlation between CT and endoscopy for antral cyst/polyp and nasal masses. Hence, CT scan is a better investigative modality of diagnosis for endoscopically inaccessible areas such as lateral end or floor of maxillary sinus.

In our study, total positive findings detected by CT scan were 372 and endoscopy were 447 so the correlation between CT scan and endoscopy came out to be 54.51%.

In a study by Gupta et al. (2004),[1] the correlation between CT and antroscopy was between 78% and 90%. The diagnostic accuracy in their study was similar to our study. In a similar study by Kasapoğlu et al. (2009),[2] correlation between antroscopy and CT was about 87%.

In our study, CT scan abnormalities were found in 45.42% of cases as compared to endoscopic abnormalities which were found in 54.57% of cases, proving thereby that endoscopy is a better diagnostic tool and CT scan may be used as an accompaniment of endoscopy.

Deosthale et al. (2017)[3] showed that endoscopy is a valuable diagnostic test in CRS and CT scan should be reserved to those with negative endoscopy but having high clinical suspicion.

It is emphasized that CT scan alone cannot be relied on for making a definitive diagnosis and if surgery is contemplated, endoscopic examination is an essential tool to confirm the CT findings and treat the patients; FESS provides diagnostic information as well as surgical solution to the disease.

In developing countries, cost factor of CT plays a role in deciding the compliance of patients. In recent times, availability of CT is increasing and it is recommended that all patients with chronic symptoms not amenable to medical management or with frequent relapses, especially requiring FESS, should undergo a CT scan of paranasal sinuses. With wider availability of CT scan, conventional radiography is bound to lose its value in evaluation of sinus diseases.

However, notwithstanding cost factor, on the basis of our study and other similar studies, it is inferred that CT scan is an essential investigation for diagnosis of nasosinus pathology, as well as a pre-requisite for FESS.

CONCLUSION

In the present study of 124 patients of CRS, it was found that NE has high specificity in diagnosing CRS. The CT scan was useful in detecting osteomeatal complex pathological changes, turbinate hypertrophy, and deviated nasal septum, which could be diagnosed equally well with NE. It was observed that endoscopy could pick up secretions in paranasal sinuses and antral polyp or mass in a better way. CT scan must be used as an accompaniment of endoscopy.

Hence, it is suggested that in every case of sinonasal disease, CT scan and endoscopy should be a reliable modality for diagnosis and management of cases.

REFERENCES