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Frequency of Nasal and Paranasal Sinus Polyps by Computed Tomography

Tehreem Alam[1], Areshba Naveed[1], Arooj Javed[1], Hira Iqbal Rao[1], Unmbreen Hassan[1], Kinza Asif[1]

[1] Faculty of Allied Health Sciences, University Institute of Radiological Sciences & Medical Imaging Technology (UIRSMIT), The University of Lahore, Pakistan

Abstract
Sinonasal disease is one of the most common clinical head and neck pathologies. The major symptom of sinonasal polyps that help in diagnosis is nasal obstruction. On Computed Tomography, sinonasal polyposis appear as round soft tissue masses originating from the mucosal lining of sinonasal cavity. Objective of this research is to check the frequency of nasal and paranasal sinus polyps by Computed Tomography. By the use of cross sectional descriptive study and convenient sampling, 59 patients were included in the study of all age groups. Patients affected with trauma or any disease resembling sinonasal disease were excluded. 128 slice Philips machine was used to obtain coronal and axial views images. SPSS 20 was used for the statistical analysis, frequencies and percentages. Total patients selected for this research were 59 out of which sinonasal polyposis affected 15 people (25.4%) which were mostly males 55.9% at an average age of 35.5 years. The mostly occurring symptom of this disease is nasal obstruction along with mucosal thickening which was found to be present in 64.4% patients. Most commonly multiple sinuses (72.9%) were affected bilaterally (61%) and bone erosion (13.6%) was found to be a less frequent variable. Males were more affected than females. This study concluded that paranasal polyps occur frequently rather than Nasal polyps.

Keywords: Sinonasal Polyposis, Computed Tomography, Frequency

Introduction

Nasal polyps are the sinonasal lesions of mucosal lining of sinuses that can result in response to inflammatory or infectious trigger (TRITT S, 2008). They appear as smooth, round, semi-translucent lesions that are most commonly occur in the middle meatus and ethmoid sinuses and 1% to 4% of the population is affected (FOKKENS W, 2007). On average there is a 2:1 male to female preponderance18. Males are almost 63% more likely to be affected than females but not a single environmental or hereditary factor has been properly related to the origin and development of this pathology till date (WHITNEY W. STEVENS M, 2016), (AHMAD MEYMANE JAHROMI, 2012). The causative agents are still unknown but there is a strong association with allergy, infection, and asthma and aspirin sensitivity (CASALE MP, et al., 2011). Because of an unknown etiology and a tendency to recur, they represent a challenge in diagnosis for the physician to treat (JONATHAN RAY NEWTON, 2008). Inflammatory polyp was the most frequently seen in sinonasal region with a peak in 20's and 30's of life (DINESH GARG, 2014). Nasal polyps are mostly benign, seen bilaterally, and frequently develop in adulthood. Unilateral nasal polyps should be checked for malignancy, and nasal polyps found in children should be evaluated for underlying cystic fibrosis (WHITNEY W. STEVENS M P. R., 2014). The

major symptom of sinonasal polyps is nasal obstruction which surely exists but its extent can vary depending on the site and size of the polyps. Patients will also frequently complain of anosmia, voice changes, rhinorrhea, snoring, ear problems, and mouth breathing is also common, post nasal drip, and less commonly facial pain (WHITNEY W. STEVENS M P. R., 2014). Family history of asthma and allergy is also important (N. MYGIND, 2000).

CT scan images have replaced conventional x-ray imaging. With the advances in CT / MRI imaging, plain radiographs are losing their importance as far as diagnosis is concerned (THIAGARAJAN B, 2013). In analyzing nasal polyps, computerized tomography is useful in determining the extent of the pathology and in surgical planning (CINGI CD, 2011). Computed tomography images can provide extensive information about the anatomy and anomalies of the paranasal sinus than plain films specifically pathologies within the sphenoid and ethmoid sinuses (RUQQAYIA ADIL, 2011). CT diagnosis has higher sensitivity, specificity, PPV and NPV in diagnosis of chronic sinusitis, sinonasal polyps, fungal sinusitis and other lesions compared to clinical diagnosis (RASHMI KANDUKURI, 2016). Computed tomography is a quick and easily accessible imaging technique. The technique is well tolerated and therefore suited to very old or fragile patients as well as children, people with claustrophobia, or patients who are critically ill and is essential if surgical treatment is to be implemented (HIMANSHU VARSHNEY, 2016). Paranasal sinuses CT images are beneficial for FESS as they provide information and help the surgeon in planning operation because coronal images show the appearance of the sinonasal region for the endoscope (GOTWALD TF, 2001). On computed tomography nasal polyps appear as rounded soft tissue masses originating from the mucosal lining of nose and paranasal sinuses. Rarely polypoidal mass is attached through a pedicle to the nasal mucosal lining can be observed in the CT images (pedicle sign). These effects include local bone remodeling. Nasal polyps don't show enhancement on injection of contrast media (VAISHALI S. SANGOLE SPR, 2013). Mucosal polyps occupy and damage the nasal cavity and the paranasal sinuses. They appear hypo dense, but may appear hyper dense due to increase in the content of protein or fungal sinusitis associated with locally occurring benign bone remodelling or bone destruction (LIANG EY, 1996). Sino nasal polyps can lead to complications like high recurrence of polyposis, asthma that can become worse due to chronic sinusitis, inhalant allergy, and obstructive sleep apnea (ADAM P. CAMPBELL, 2017).

Nasal polyps cannot be cured but treated by medications. Corticosteroids and pills are the medications often used to treat sinonasal polyps. Antibiotics are prescribed if patient has bacterial sinus infection and if the condition gets worse, patient undergoes surgery (JONATHAN RAY NEWTON K. W.-S., 2008). These sinonasal polyps are typically treated with nasal sprays that contain steroids in them which decrease the sinus mucosal inflammation and reduce the polyps size. If it does not result in improvement of patient, surgical treatment may be advised (JONATHAN RAY NEWTON K. W.-S., 2008).

Finding the frequency of nasal and paranasal sinuses polyps by computed tomography can benefit us in way that it may provide us with the knowledge about how many people on an average are affected by this particular disease.

Methods

It was a cross sectional descriptive technique and convenient sampling, 59 patients were included in the study of all age groups. The study was performed for 3 months after the approval of synopsis. Patients who were affected with trauma or any disease resembling sinonasal disease were excluded. 128 slice Philips machine was the equipment used to obtain coronal and axial views images. SPSS 20 was used for the statistical analysis, frequencies and percentages were found. The study conducted to find out the use of computed tomography scans to analyze the frequency of nasal and paranasal sinus polyps in patients with presenting symptoms and diagnosed with nasal pathology in a selected population.

Results

It was a cross sectional descriptive technique and convenient sampling, 59 patients were included in the study of all age groups. Patients without sinonasal polyps were 15 (25.4%) and patients with sinonasal polyps were 15

(25.4%). Total number of patients selected for this research were 59 out of which sinonasal polyposis affected males about 55.9% most commonly at the age of 35.5 years. The most frequently occurring symptom associated to this disease is nasal obstruction along with mucosal thickening which was found to be present in 64.4% patients. Most commonly multiple sinuses (72.9%) were affected bilaterally (61%) and bone erosion (13.6%)was found to be a less frequent variable.

Table 1: Frequency of male and female Patients.

Gender		
	Frequency	Percent
F	26	44.1
M	33	55.9
Total	59	100.0

Table 2: Unilateral sinuses.

Unilateral Sinuses		
	Frequency	Percent
0	43	72.9
1	16	27.1
Total	59	100.0

Table 3: Bilateral Sinuses.

Bilateral Sinuses		
	Frequency	Percent
0	23	39.0
1	36	61.0
Total	59	100.0

Table 4: Frequency of nasal polyps**.**

Nasal Polyps		
	Frequency	**Percent**
0	**45**	**76.3**
1	**14**	**23.7**
Total	**59**	**100.0**

Table 5: Frequency of nasal polyps.

Paranasal Polyps		
0	44	74.6
1	15	25.4
Total	59	100.0

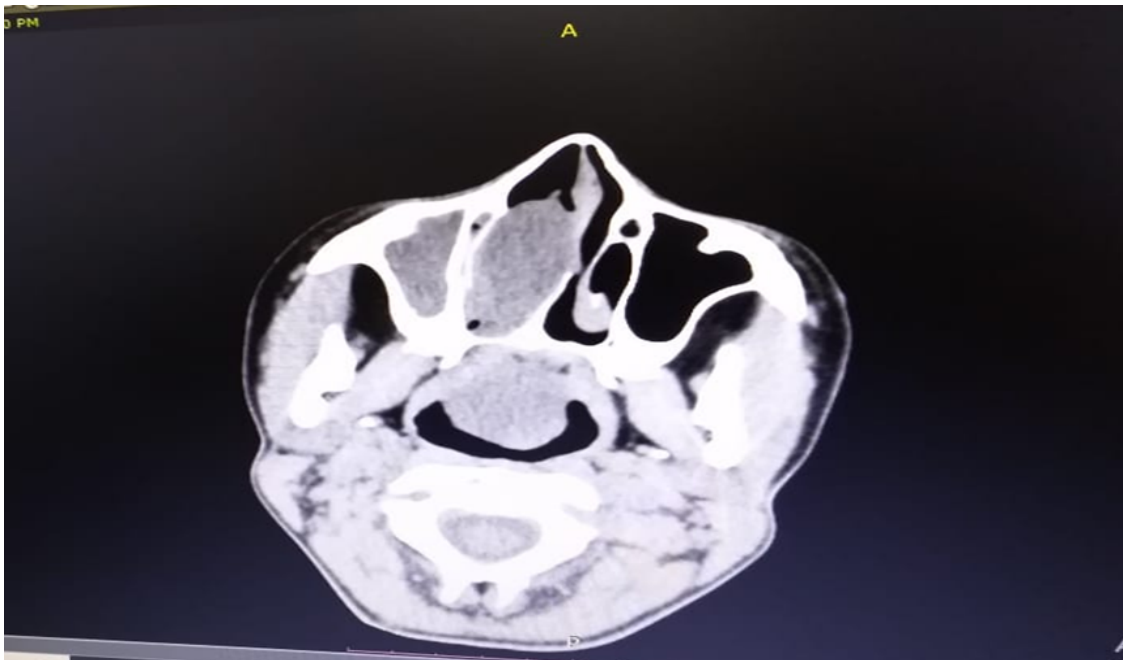

Figure 1: Right sinonasal polyposis involving maxillary and ethmoid sinuses.


Figure 2: Bilaterally occurring polyps involving frontal, ethmoid and sphenoid sinus.

Discussion

It was an observational cross sectional study conducted in the radiology department of Al Razi Healthcare, Lahore. that included 59 patients. The data was collected using consecutive technique from September 2018 to November 2018. A questionnaire was used for each patient, filled out on the basis of history and image findings. Computed tomography technique is useful to detect the sinonasal pathologies such as polyps etc. Nasal polyps are the most common expansible lesions in the nasal cavity. They are associated with allergy, vasomotor rhinitis, and inflammation. In mostly cases sinonasal polyps discovered incidentally have no previous history of sinonasal disease.

According to Abbas O. Hussein's research published in the year 2012, performed in the ENT Khartoum specialist hospital and Ibn El Haitham diagnostic center from 2012 to 2014, total 240 patients were recorded 111 were males while 129 were females. Patients were suspected for having paranasal sinuses disease. X-ray water's view and CT of axial and coronal planes were performed. Females (54%) were more commonly affected than males (46%). Their research shows that the commonly involved pathology of the sinuses was the polyp with 33.8%. Their research reveals that commonly affected sinus was maxillary sinus (72.1%) followed by ethmoid sinus (45.4%) and then frontal (31.7%) and sphenoid sinuses (27.2%). So according to them, for the detection of paranasal sinuses pathologies CT is gold standard method (SAMUEL MÁRQUEZ, 2008).

Study conducted by Leif Johansson and his fellows which was published in 2003. The main target of their study was to find out the prevalence of sinonasal polyps in adults Swedish population co-related to their age, gender, asthma and aspirin sensitivity, a sample of 1900 people above the age of 20 years were selected from the municipal population registered in Skovde Sweden in the month of December in year 2000. The question which were included in the study were about rhinitis, asthma and aspirin insensitivity total 1387 volunteers were investigated. The total prevalence of polyps was 2.7% the polyps were most commonly found in elderly men. It was also found in the asthmatic patients. Aspirin insensitivity was not found to be associated with polyps. This study was considered as the representative of Swedish population (WHITNEY W. STEVENS M P. R., 2016).

Study conducted by Aakanksha Rathore and Abhinandan Bhattacharjee, published in 2017 at Silchar Medical College and Hospital Silchar, India. Total 34 patients were included and CT scan showed 20 patients with 58.9% with sinonasal polyposis. Maxillary sinus was most commonly involved. They concluded that Computed Tomography provides great anatomical information in sinus involvement and variations so CT is the gold standard for diagnosing sinonasal polyposis and the results may also be advisable to endoscopic sinus surgeons (N. MYGIND, 2000).

Study conducted by Satish Nair and his fellows, published in 2013, in their review article they aimed to analyze the different presentation of patients with single sided nasal mass to identify the features of neoplastic pathology. They took the retrospective view of all the cases presented with unilateral nasal mass from Jan 09 to Jan 10 at a tertiary care hospital. In the retrospective review total 53 patients were included 29 females and 24 males. They found that the benign nasal polyp was the most common inflammatory condition and inverted papilloma was common neoplastic disease. In the inflammatory condition CT scan revealed the sinus opacity presence of high attenuated areas without bone erosion. While neoplastic conditions showed significant symptoms and, bony destruction and soft tissue involvement on the CT scans. The CT is modality of choice to differentiate between inflammatory and neoplastic conditions. Biopsy is usually done for neoplastic conditions (FOKKENS WJ LV, 2012).

Study conducted by Hemant Chopra, published in 2008. His aim was to compare the clinical, radiological and histological findings in the patients presented with nasal polyps. He conducted prospective randomized study, 50 patients were included diagnosed clinically and by the use of radiations with nasal polyps in Dayanand Medical College and Hospital Ludhiana. Radiologic investigations included CT scan and MRI of the patients it helped about the extent of disease, type of pathology and its expansion also with destruction of sinus for any type of complication. FESS was performed which was followed by histopathology of the surgically removed polyps. Results showed that 70% of clinical findings were consistent with radiologic findings. He concluded that clinical, radiological and histopathological analysis should be done for proper evaluation of nasal polyps, and radiology provides information about complication and a road map to endoscopic surgeries (S, 1996).

Therefore our study highly supports the above mentioned studies, we only took patients who had the symptoms of nasal and paranasal sinus polyposis. With Computed Tomography frequency of patients affected polyps was found among 59 patients of all ages. Polyposis affected males about 55.9% more commonly at the age of 35.5 years. This frequency is found to be increasing over the years There was no gender specification in this study. The aim of this research work was to observe the role of CT scan for finding out the frequency of patients affected with sinonasal polyps in Lahore, City population. These all radiological confirmative signs were found more accurately on CT and was among those variables that scored high in the frequency column and confirmed the accuracy of CT in the diagnosis of Sinonasal polyposis.

Conclusion

Males were more affected than females. This study concluded that paranasal polyps occur frequently rather than Nasal polyps.

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