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USEFULNESS OF X-RAY OF PARANASAL SINUSES IN EVALUATION OF SINO-NASAL PATHOLOGIES TAKING COMPUTED TOMOGRAPHY AS GOLD STANDARD

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ABSTRACT

BACKGROUND: Sinonasal pathologies are quite common in all parts of the world. It affects rural population more commonly than urban population due to disparities in climatic conditions and hygienic standards. X-Ray is an initial investigation offered to the patients by almost all otolaryngorhinologists and Computed tomography(CT) is asked for to make a confirmatory diagnosis as well as to know the anatomical details before undertaking any surgery. In this article, we have endeavored to evaluate the role of X-Ray in assessing sino-nasal pathologies and its contribution in helping the radiologists/otolaryngorhinologists to arrive at a definitive diagnosis.

AIMS: To assess the usefulness of X-Ray in evaluation of sino-nasal pathologies and to see whether it can help the radiologists/otolaryngorhinologists to reach a conclusive diagnosis.

MATERIALS AND METHODS: a total of 80 cases of suspected sinonasal pathologies were included in our study. All the cases were underwent X-ray and CT. data were compared and analysed by ANOVA method.

RESULTS: 68 cases had different sinonasal pathologies. 21 cases had sinusitis, 30 cases had mucosal thickening, 4 cases had polyps, 5 cases had deviated nasal septum, 2 cases had isolated inferior turbinate hypertrophy and11 cases had inferior turbinate hypertrophy along with sinusitis or mucosal thickening. 2 cases had mass lesions-one involving the left maxillary sinus and the other involving the nasal cavity. 2 cases had mucoceles- one in frontal sinus and the other in ethmoid sinus. Frontal osteoma was seen in 2 cases.X-Ray could pick up 8 cases of sinusitis with air-fluid level, 8 cases of mucosal thickening, 2 cases of polyps, all 5 cases of DNS, 10 cases of inferior turbinate hypertrophy, 1 case of mass lesion, 1 case of mucocele and 1 case of frontal osteoma.

CONCLUSIONS: sensitivity and specificity for detection of sinonasal pathologies is far superior with CT scan compare to X-ray. As such , CT scan is the gold standard for diagnosis of sinonasal pathologies and should be advocated for accurate diagnosis of all cases with suspected sinonasal diseases.

KEYWORDS : sinusitis,polyp, mucosal thickening,osteoma,inferior turbinate,mucocele,X-ray,computed tomography.

INTRODUCTION:

Sinonasal pathologies are quite common in all parts of the world.cutting across age , sex, religion, and geographical location. It affects rural population more commonly than urban population due to disparities in climatic conditions and hygienic standards. Children and aged people are common victims of sinonasal diseases. X-Ray is an initial investigation offered to the patients by almost all otolaryngorhinologists and Computed tomography(CT) is asked for to make a confirmatory diagnosis as well as to know the anatomical details before undertaking any surgery. In this article, we have endeavored to evaluate the role of X-Ray in assessing sino-nasal pathologies and its contribution in helping the radiologists/ otolaryngorhinologists to arrive at a definitive diagnosis.

MATERIALS AND METHODS:

We included 80 cases of suspected sino-nasal pathologies in our study. All the cases were first subjected to digital X-Ray (). Then they were scanned with 16 slice CT Scanner(GE somatom sensation 16) in both axial and coronal planes. The results of both X-Ray and CT were analysed by two radiologists and inference was drawn by consensus. Sensitivity and specificity of X-Ray were calculated assuming both to be 100% for CT.

RESULTS:

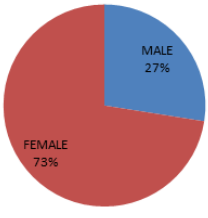
Of the 80 cases 58 were females and 22 were males. 41 patients were between 20-30 years of age.22 cases were between 31-40 years of age, 12 cases were between 41-50 years of age, 5 cases were in the pediatric age group (8-14 years).

Of the 80 cases, 68 had different forms of sino-nasal pathologies as detected by Computed Tomography-i.e.21 cases had sinusitis, 30 cases had mucosal thickening, 4 cases had polyps, 5 cases had deviated nasal septum, 2 cases had isolated inferior turbinate hypertrophy and11 cases had inferior turbinate hypertrophy along with sinusitis or mucosal thickening. 2 cases had mass lesions-one involving the left maxillary sinus and the other involving the nasal cavity. 2 cases had mucoceles- one in frontal sinus and the other in ethmoid sinus. Frontal osteoma was seen in 2 cases.

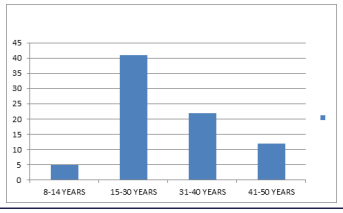
X-Ray could pick up 8 cases of sinusitis with air-fluid level, 8 cases of mucosal thickening, 2 cases of polyps, all 5 cases of DNS, 10 cases of inferior turbinate hypertrophy, 1 case of mass lesion, 1 case of mucocele and 1 case of frontal osteoma.

Sensitivity and specificity of X-Ray was maximum for DNS (100% and 100% respectively) and frontal osteoma (100% and 100% respectively) , followed by inferior turbinate hypertrophy (77% and 84 %) and was least for mucosal thickening (27% and 21 %) respectively.

Graph1: sex distribution



Graph 2: Age distribution



Graph3: comparative detection rate by CT and X-RAY for different pathologies

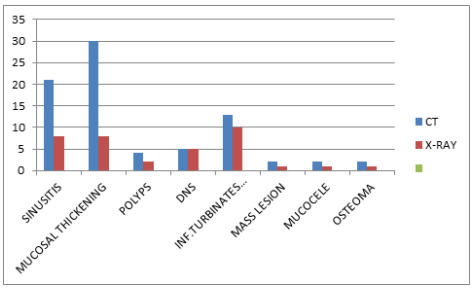


Fig 1: CT shows mucosal thickening but X-RAY could not detect it

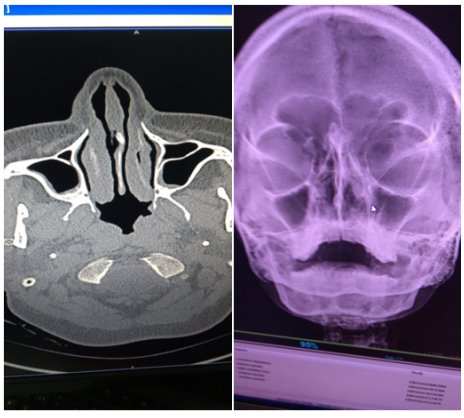
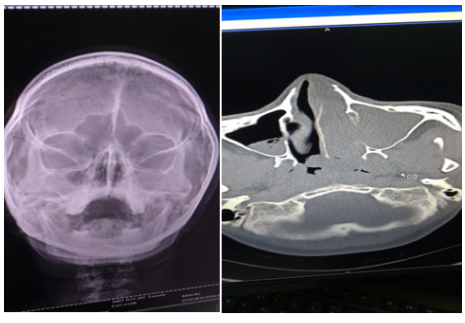


Fig 2: X-ray shows haziness in both maxillary antra , CT shows antro-choanal polyp on left side and mucosal thickening on right side thus conferring higher degree of specificity in diagnosis



DISCUSSION:

Sino-nasal pathologies account for a major share of total disease burden in the community. Depending on climatic conditions and hygienic standards the incidence and prevalence varies from one geographical location to another and from one socio-economic stratum to another. X-ray is the initial modality of investigation offered to these patients. However sensitivity and specificity of CT is far superior to X-ray. Of the 80 cases, 68 had different forms of sino-nasal pathologies as detected by Computed Tomography-i.e.21 cases had sinusitis, 30 cases had mucosal thickening, 4 cases had polyps, 5 cases had deviated nasal septum, 2 cases had isolated inferior turbinate hypertrophy and11 cases had inferior turbinate hypertrophy along with sinusitis or mucosal thickening. 2 cases had mass lesions-one involving the left maxillary sinus and the other involving the nasal cavity. 2 cases had mucoceles- one in frontal sinus and the other in ethmoid sinus. Frontal osteoma was seen in 2 cases, while X-Ray could pick up 8 cases of sinusitis with air-fluid level, 8 cases of mucosal thickening, 2 cases of polyps, all 5 cases of DNS, 10 cases of inferior turbinate hypertrophy, 1 case of mass lesion, 1 case of mucocele and 1 case of frontal osteoma. Therefore, CT scores over X-ray in detection different sino-nasal pathologies.

CONCLUSIONS:

For detection of osteoma, DNS or inferior turbinate hypertrophy, X-Ray is quite a reliable investigation. But for detectioin of mucosal thickening, sinusitis, mass lesion, polyp or mucocele, sensitivity of X-Ray is poor. Hence, computed computed tomography should be done in all suspected cases of sino -nasal pathologies considering it as a gold standard.

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