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A prospective study of bacteriology and antibiotics treatment of maxillary sinusitis

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Abstract
In the present study titled "Prospective Study of Bacteriology and Antibiotics Treatment of Maxillary Sinusitis", 100 patients attending the E.N.T. OPD with signs and symptoms of Sinusitis were selected based on exclusion criteria. Among the patients in this study, 47% were males and 53% remaining were females. Highest age incidence was in the third decade i.e. 20-29 age groups. Least commonly affected were elderly more than 50 years. All these patients were prescribed appropriate antibiotics based on C/S report. Out of 100 patients, 90 patients yielded growth of different organisms on culture. Efficacy of Ciprofloxacin tinidazole 85% by clinically, 87% based on results on DNE findings & 63% by Radiological success rate. The roentgen finding of air-fluid level in the maxillary sinus is the most reliable evidence of sinus infection followed by opacity. While in most of the cases, hazy antra and mucosal thickening on X-ray are not indicators of sinus infection. Hence we conclude that Water's view undoubtedly yields valuable information regarding sinus pathology.

Keywords: bacteriology, antral lavage, rhinosinusitis, antibiotics, maxillary sinusitis, paranasal sinuses

1. Introduction
Infection of the sinuses is one of the commonest causes of patients visit to the otorhinolaryngologist. Around one in five cases seen in outpatient department is concerned with sinus disease. The prevalence of sinusitis (146/1000) has been reported to exceed that of any other chronic condition and is apparently on the rise. It is estimated that between 30 and 50% of all patients seen by the family practitioner suffer from some form of rhinosinusitis. Estimates suggest that sinusitis is more widespread than arthritis or hypertension. Sinusitis significantly impacts quality of life, even in comparison to chronic debilitating diseases such as diabetes and congestive heart failure. Furthermore chronic sinusitis not only causes significant physical symptoms but also results in substantial functional and emotional impairment. It is fairly well accepted that rhinosinusitis is one of the most common reasons that an individual seeks medical care, resulting in high direct medical costs, including the cost of an office visit, diagnostic tests (such as cultures and laboratory or radiologic tests), antibiotics or other pharmaceuticals, procedures or surgery, hospitalizations, and/or complications of treatment. Sinusitis is the fifth most common medical diagnosis for which antibiotics are prescribed. Sinusitis is usually managed with a 10 days complete course of appropriate sensitive antibiotics. To achieve this goal, there should be some diagnostic modality which guide as towards exact diagnosis and safe intervention. Over past decade, X ray Paranasal sinuses (Water's view) and nasal endoscopy have been used successfully as diagnostic modality in sinus disease. Majority of India,,s population resides in rural areas where the only medical facility available is the Primary health centre. Most commonly done and the only available investigation in such places is a Plain Radiograph. Antral lavage has been used both in the diagnosis and as therapy for sinusitis. Due to lack of affordability and infrastructure development in our country, its role in clarifying Plain X-ray paranasal sinuses (Water's view) may still be relevant here. Hence in this study we assessed efficacy of different class of antibiotics in treatment of maxillary sinusitis and treatment response assessed with help of diagnostic endoscopic findings and radiologically by X ray PNS Water‟s view findings.

Aim and Objectives
To study the bacteriology of maxillary sinusitis. To compare efficacy and safety of different antibiotics for treatment of maxillary sinusitis.

Review of Literature
Susruta, the father of surgery, described arteries, veins and nerves as ducts in the nose and mentioned 24 ducts in the nose [1]. One of the earliest tubular nasal speculum termed Nadiyantara is described in ancient Hindu medicine. In the Sanskrit text of Susruta-samhita (6th century B.C.) it is recommended for the diagnosis of 31 nasal diseases [2].
Leonardo da Vinci in Milan in 1489 was the first to prepare and draw anatomical specimens of the paranasal sinuses. The first clear indication of the existence of the paranasal sinuses was provided by Berenger del Carpi, anatomist and surgeon at Bologna in the early 16th century [3]. In 1600, Fallopius referred to the maxillary sinus and suggested that the sinuses were absent in children until they reached maturity. In 1651, Nathaniel Highmore presented the first detailed description and drawing of the maxillary sinus and hence it is named as Highmore's antrum [4]. Antral lavage is performed by raising a bottle with irrigation fluid at a slow constant rate, by means of an elevator. The height between the fluid level and a point one

cm below the infra-orbital margin is measured when the fluid starts to drop from the nose. The results of 100 irrigation s in 57 patients show that the ostial resistance is more pronounced in chronic than in acute sinusitis. The ostial resistance decreases in acute sinusitis when the inflammation subsides, while it usually remains high in chronic sinusitis even when there is no mucus or pus in the antral lavage. The causal relationship of allergic rhinitis to rhinosinusitis is conflicting, although there is no question that there is an increased association of allergic rhinitis in patients with CRS [5]. Acute bacterial rhinosinusitis is more common in adults with allergic rhinitis [6]. The concordance of allergy and CRS ranges from 25 to 50 % with paediatric studies reporting the higher association [7].

Pelikan and Pelikan-Filipek showed a possible causal relationship, because 75 % of their allergic patients with CRS showed an increase in sinusitis by plain sinus films after nasal allergen challenge [8]. Nayak *et al* (1991) studied a group of 78 patients between 12 to 57 years with chronic sinusitis over a period of 16 months with various nasal complaints, the commonest being nasal discharge followed by headache and nasal obstruction, with a range of duration of symptoms being 3 months to 30 years [9]. A retrospective study of 129 patients was done between July 1991-Dec 1993 with CRS refractory to medical treatment by Nasser A Fageeh *et al*. The commonest complaint being nasal obstruction (76%), headache (74.4%), anosmia (56.5%) & facial pressure/pain (50%) [10]. Plain radiography has a limited role in the management of sinusitis. Possible findings in acute sinusitis include mucosal thickening, air fluid levels, and complete opacification of the involved sinus. Although mucosal thickening is seen in more than 90% of sinusitis cases, it is very non- specific. Air-fluid levels and complete opacification are more specific but are seen only in 60% of cases. Interpretation of plain radiographs can vary widely among different observers, and there is a high rate of false-negative results. [11]. Ultimately, however, the common pathway of acute sinusitis is thought to be presence of bacteria in a sinus cavity with an obstructed ostium. In addition, abnormalities of the quantity or consistency of the sinonasal secretions can affect mucociliary clearance and promote bacterial growth. There are multiple factors that can lead to anatomic obstruction of sinus ostia. In most cases, it is oedema secondary to inflammation that constricts the small sinus openings in a reversible fashion. Examples of anatomic obstruction would include septal deviations, polyps, nasal tumours, foreign bodies or post-surgical synechiae. Once the ostium becomes occluded, a local hypoxia develops in the sinus cavity and sinus secretions accumulate. This combination of low oxygen tension and a rich culture medium of secretions allow exponential bacterial growth to occur within the sinus.

Materials and Methods

The present study entitled 'A Prospective Study of Bacteriology and Antibiotics Treatment Of Maxillary Sinusitis' was conducted in the Department of Otorhinolaryngology of KIMS Deemed University Karad, during the period November 2011 to May 2013. All the patients with clinical manifestations of maxillary sinusitis, visiting the ENT OPD at KIMSDU Karad diagnosed clinically, diagnostic nasal endoscopy findings and radiologically and were treated.

Observations and Results

For the study 'A Prospective Study of Bacteriology And Antibiotics Treatment Of Maxillary Sinusitis', 100 patients attending the E.N.T. OPD with clinical features of sinusitis were chosen randomly. They were subjected to clinical examination, radiographic examination and diagnostic endoscopy, followed by diagnostic proof puncture.

Table 1: Distribution of Cases According to Age

Age in yrs	No. of patients	Percentage
<20	14	14
20-29	46	46
30-39	18	18
40-49	15	15
>50	07	07
Total	100	100

As shown in table no. 1, highest age incidence was in the third decade i.e. 20-29 age groups. Least commonly affected were elderly more than 50 years.

Table 2: Color of Nasal mucosa

Mucosa	No. of Patients	Percentage
Congested	67	67
Pale	21	21
Normal	12	12
Total	100	100

As shown in table no. 2, most of the patients had Congested nasal mucosa (67%). Pale mucosa was seen in 21%patients.

Table 3: Clinical Diagnosis

Diagnosis	No. of patients	Percentage
Ars	39	39
Sars	05	05
Crs	45	45
Aecrs	10	10
Rars	01	01
Total	100	100

As shown in table no. 3, according to the 1997 Rhinosinusitis Task Force classification based on duration of symptoms. Chronic rhinosinusitis (45 %) was the most common diagnosis followed by Acute rhinosinusitis (39%).

Table 4: Results of Antral Lavage (proof puncture)

Returning Fluid	Total	Percentage
Clear	28	28%
Mucoid	8	8%
Mucopurulent	11	11%
Purulent	53	53%

As shown in table no. 4, of all the sinuses irrigated, 28% returns obtained were Clear. Among the abnormal returns, most common was the purulent returning fluid found in 53% sinuses. Mucoid and Mucopurulent returns were obtained

from 8% and 11% antra respectively.

Discussion

This study was conducted in the department of Otorhinolaryngology, KIMSDU, Karad during the period - Nov 2011 to May 2013. Totally 100 patients diagnosed clinically as maxillary sinusitis were subjected to Radiographic (Water‟s view PNS) examination and diagnostic nasal endoscopic [DNE] examination. Out of these 100 X rays, 87 X rays showed abnormal findings and out of 100 patients, 90 patients showed abnormal findings on DNE. Then all these were irrigated. The findings were noted, tabulated, compared. The results of the present study are discussed with those of the previous studies. According to McNeil [12]. *et al*. study, maximum age incidence was in 4th decade. While in the studies by Vourinen *et al.* [13], Axelsson *et al*. [14], Kurien *et al*. [15] and also the present study, highest incidence was seen in the 20-29 age group (3 rd decade). In the study by Arruda *et al.* [16], swelling of the nasal mucosa was present in 60% of cases. Nasal discharge was noted in 36% and postnasal drip in only 12% cases.

Conclusion

The present study titled “a Prospective Study of Bacteriology And Antibiotics Treatment of Maxillary Sinusitis” was undertaken with the aim of evaluating bacteriology of maxillary sinusitis and the value of Plain X-ray paranasal sinuses (Water’s view) and Diagnostic nasal endoscopy (DNE) in the diagnosis of Rhinosinusitis and post-treatment evaluation of efficacy of different class of antibiotics The patient presenting with symptoms of sinusitis should be evaluated by Detailed history taking and thorough clinical examination. Depending on the 1997 RTF criteria patient is diagnosed as ARS, CRS, SARS, AECRS or RARS. Chronic rhinosinusitis was the most common diagnosis followed by acute rhinosinusitis. All these clinically diagnosed patients should undergo Plain X-ray PNS (Water‟s view) for initial radiological evaluation and Diagnostic nasal endoscopy. Antral puncture can be done for confirming the radiographic and DNE diagnosis of maxillary sinusitis. From the above study it is clear that the roentgen finding of air-fluid level in the maxillary sinus is the most reliable evidence of sinus infection followed by opacity. While in most of the cases, hazy antra and mucosal thickening on X-ray are not indicators of sinus infection. Hence we conclude that Water‟s view undoubtedly yields valuable information regarding sinus pathology. Although the imaging modality of choice in sinusitis is CT scan, it is impractical in certain settings. Particularly in underdeveloped and rural areas with an unaffordable populace, Plain X-ray is still a worthwhile investigation for the diagnosis and treatment of sinusitis. It should not be accepted as a diagnosis in itself but considered in the light of the patient’s history and clinical findings.

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