RESULTS OF IRRIGATION OF MAXILLARY SINUS WITH METRONIDAZOLE AFTER ANTRAL WASHOUT IN PATIENTS WITH CHRONIC MAXILLARY SINUSITIS

Amir Ali Khan, Amanat Ali Shah*, Tehmina Rehman, Abdullah**

Combined Military Hospital Bahawalpur Pakistan, *Combined Military Hospital Mangla Pakistan, **Massachusetts University of Pharmacy and Health Sciences Boston Massachusetts America

ABSTRACT

Objective: To compare the results of antral washout with and without metronidazole irrigation of maxillary sinus in patients with chronic maxillary sinusitis.
Study Design: Quasi experimental study.
Place and Duration of Study: This Quasi experimental study was carried out in Combined Military Hospital Khuzdar and Combined Military Hospital Attock, from Mar 2013 to Apr 2015.
Patient and Method: One hundred patients who were between 20-50 years of age were included in this study. Half of them received antral irrigation of metronidazole in addition to postoperative oral antibiotics were compared with the other half who received just oral antibiotics after antral washout procedure. Clinical success was compared in both groups in terms of patients becoming asymptomatic.
Results: Clinical success in both groups at the end of the study was 94% and 80% of patients with antral irrigation of metronidazole and without it respectively showing that metronidazole irrigation is superior method.
Conclusion: Antral irrigation with metronidazole after antral washout procedure in patient with chronic maxillary sinusitis is very effective in early recovery from the disease.

Keywords: Metronidazole, Rhinorrhea, Sinusitis.

INTRODUCTION

Paranasal sinuses are hollow spaces in few bones of the skull. The paranasal sinuses, along with the turbinates, help in warming and humidification of air and contribute to the body's defenses against microbial ingress[1]. The maxillary, frontal and anterior ethmoidal lies anteriorly while posterior ethmoidal and spheroidal sinuses lies posteriorly. The maxillary sinus is present at birth and attains its adult size at the age of 15[2]. It lies in the maxilla, largest of all sinuses, pyramidal in shape with its base towards the lateral wall of the nose and apex in the zygoma. The lining mucosa is ciliated columnar epithelium with goblet cells which secrete mucous and the cilia push the mucous into the nasal cavity through the ostium of the sinus[3]. The opening of maxillary sinus is high up on the lateral wall of the nose and on average is 2.4 mm in diameter. The bone window is much larger but the effective ostium is reduced by an extension of the inferior turbinate, the uncinate process and the surrounding soft tissues[1]. The maxillary sinus can very rarely be absent or hypoplastic but usually is the first to develop, showing two main growth spurts at 0-3 years and the second at 7-12 years with corresponding permanent dentition and facial growth. The molar teeth are in closest relation to the maxillary sinus[1]. A wide range of disease processes can involve the maxillary sinus arising either from within the lining of the sinus, the adjacent paranasal sinuses, nasal space, dental and oral tissues, or in the adjacent bone with expansion into the sinus. Inflammatory sinus disease is the most common disease process involving the paranasal sinuses[3]. Acute recurrent infection of the maxillary sinus causes destruction of cilia which leads to stagnation of secretions and further infection, edema and polyp formation. Chronic rhinosinal disease is the term generally

Correspondence: Dr Aamir Ali Khan, ENT Department, Combined Military Hospital Bahawalpur Pakistan
Email:amir_khan2791@yahoo.com
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used to describe nasal congestion or discharge that persists for eight to 12 weeks. Chronic sinusitis may be caused by an infection but it can also be caused by growth in the sinuses/nasal cavity (polyps) or by a deviated nasal septum. The disease is more common in young and middle aged adults but can affect children[4]. Chronic disease rarely causes symptoms of pain except during acute exacerbations. Chronic rhinosinal disease is usually bacterial rather than viral[4]. The most common pathogens involved are Streptococcus pneumoniae and Haemophilus influenza[5,6]. There is an increased frequency of B lactamase production by Haemophilus influenza and Moraxella catarrhalis, penicillin resistant staphylococcus aureus and multiple drug resistance of streptococcus pneumonia; the surface epithelium may show sign of desquamation, regeneration or metaplasia while the submucosa infiltrated with lympho-cytes and plasma cells. Micro abscesses, granulation, fibrosis and polyp formation are usually present. Mixed aerobic and anaerobic organisms are often seen. Patient has vague symptoms like purulent rhinorrhea, nasal obstruction, anosmia, pain over the face and headache. An x-ray paranasal sinus confirms thickening of mucosa and opacification of the sinus. While CT scan shows minor details. Treatment of chronic disease, namely nasal congestion and discharge, is the same as for acute disease, with nasal irrigation and nasal decongestants in the first instance. Nasal decongestants may be used for a prolonged period on the basis that their use is restricted to once daily[7]. When polyps are present, steroids, either topical or systemic, may be prescribed[8]. Chronic disease or recurrent acute disease that does not respond to conventional medical therapy may require surgery[9]. Treatment is aimed at restoring normal mucociliary function and clearance of the sinuses may be undertaken[10]. Management of such patients includes proper antibiotic cover, amoxillin and clavulanic acid is very common regimen[11]. But cephalosporins are recommended more in recent guidelines e.g., cefuroxime, levofloxacin and cefdinir are considered very effective[12], nasal decongestant, antihistamines and intra nasal steroids in the form of sprays make the medical treatment complete[13]. Surgical option includes antral puncture and irrigation. This includes entering the sinus through the inferior meatus with the help of a canulla. The sinus is then cleared by removing the pus and fluid present inside. It is then thoroughly washed with normal saline. Other procedures include intranasal antrostomy, Caldwell Luc operation and Functional endo-scopic sinus surgery[14].

MATERIAL AND METHODS

This quasi experimental study was carried out in Combined Military Hospital Khuzdar and Combined Military Hospital Attock from Mar 2013 to Apr 2015. One hundred patients were included ranging between 20 and 55 years of age and of both gender. All patients had more than 12 weeks history of purulent nasal discharge, headache and pain over the face. X-ray paranasal sinus sub occipeto mental view was done to confirm that they were having chronic maxillary sinusitis. Among these, 43 patients had deviated nasal septum, 15 had bilateral ethmoidal polyps and rest of 42 patients had bilateral inferior turbinate hypertrophy. In patients with deviated nasal septum septoplasty was done after antral wash out. Similarly 15 patients who had ethmoidal polyps undergone intra nasal polypectomy in addition to antral wash out while bilateral inferior turbinectomy was done in 42 patients with hypertrophied inferior turbinates along with antral wash out. They were divided into two groups. Group A comprising of 50% patients of all the above three categories received post-operative antral injection of metronidazole and then oral antibiotics including Levofloxacin 250 mg twice daily and metronidazole 400 mg thrice daily for 7 days While group B with same number of patients received only oral antibiotics for the same duration of time. Afterwards patients

were examined on weekly basis for four weeks for remission of their symptoms.

RESULTS

Total 100 patients were included in this study. Fifty in each group, In group A, 44 out the 50 patients that is 88% showed excellent response; they were free of symptoms when reviewed after 2 weeks while 6 patients continued to have rhinorrhea and headache. These patients were given another course of antibiotic and reviewed after four weeks, 3 out of the remaining 6 patients were symptom free but remaining 3 persisted with the disease. In group-B, 36 out of 50 patients that is 72% were symptoms free at the end of second week while 14 patients continued to have rhinorrhea and headache and they were given another course of antibiotics. On review of these remaining 14 patients after four weeks of surgery 4 were symptom free. The remaining 3 patients of group A and 10 patients of group B were advised to undergo endoscopic procedure (table). Overall clinical success in both groups at the end of the study was 94% and 80% of patients with intra antral irrigation of metronidazole and without it, respectively so it can be concluded that response of the patients in group A (who were given irrigation with metronidazole and oral antibiotics) is better than group-B.

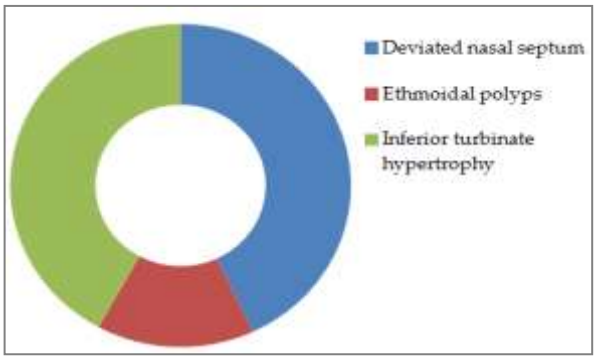

Figure: Underlying causes of chronic maxillary sinusitis leading to chronic maxillary sinusitis.

Table: Summary of Post-operative Patients clinical response.

	Second week	Fourth week	Total cured
Group A n(%)	44 (88)	3 (6)	47 (94)
Group B n(%)	36 (72)	4 (8)	40 (80)
Total	80	7	87 (87)

DISCUSSION

Sinusitis is inflammation of the sinuses usually due a viruses, bacteria, or fungi. It may be acute or chronic. Normally sinuses contain no bacteria. Mucus that is continuously secreted is able to wash out and air is able to circulate. At times sinus openings become blocked due to inflammation or excessive mucus secretion, bacteria and can grow more easily and irritating immune factors which are released in the osteomeatal complex area. Conditions predisposing sinusitis includes cilliary dysfunction, allergy, nasal polypi, deviation of nasal septum, cold and asthma (figure). Other includes Kartagener syndrome, immotile cilia syndrome, tooth infections, immune deficiency i.e: HIV, chemotherapeutic drugs. Chronic sinusitis is caused by a wide range of organisms as already discussed including Streptococcus pneumoniae, heamophilus Influenzae, Moraxella catarrhalis, Staphylococcus aureus, and anaerobic bacteria, Fusobacterium, Prevotella, Porphyromonas and Peptostreptococcus, and fungi, Aspergillus, Penicillium, Cladosporiuim, Altenaria and Candida. Emanuel IA, Shaw et al, discovered fungi in 96% of people with chronic sinusitis. Other studies showed 90% of people that had nasal congestion for more than a year had positive cultures of Chlamydia pneumoniae. Many anaerobes become resistant to antibiotics or are not responsive to them at all[15]. The antibiotics therapy becomes more effective when anaerobes are also covered using second-or third-generation cephalosporins ie: (cefuroxime, cefpodoxime, cefdinir), fluoroquinolones eg (ciprofloxacin, levofloxacin, moxifloxacin), Sinusitis due to dental problems or those with foul-

smelling discharge metronidazole is essential. Metronidazole (1-B-hydroxyethyl-2-methyl-5-nitromidazole) is a synthetic anti-bacterial and antiprotozoal agent[16]. The drug acts by inhibiting nucleic acid synthesis by disrupting the DNA of microbial cells. It is very effective against anaerobic bacteria and less destructive to aerobes and human cells[17]. This is particularly important in patients who are immuno-compromised or in intensive care, in these patients sinusitis can be a prominent source of sepsis. Antral wash out can usually be done under local anesthesia; however a general anesthesia is used in apprehensive patients .Antral wash out and irrigation with metronidazole solution provides means of removal of thick purulent sinus secretions. The drug in the maxillary antrum provides good cover against anaerobic bacteria, reduces the chances of recurrence and enhance mucociliary flow. Antral washout should be done when appropriate medical therapy has failed to control the infection, recurrence of the disease or in complications of sinusitis. Sng and Wang studied 31 randomized control trials. The clinical efficacy and side effects of cefuroxime axetil, telithromycin, amoxicillin/ potassium clavulanate, levofloxacin, moxifloxacin and metronidazole in the treatment of sinusitis. Among them, 9 studies were performed double-blinded with placebo controls. The results showed that these antibiotics are more efficacious than placebo in the treatment of bacterial sinusitis. Patients who live in communities usually have a high incidence of resistant organisms, those failing to respond to oral antibiotic therapy, and those with persistence of symptoms even after 10-14 days should be considered for antral washout and irrigation with metronidazole solution. Similarly in vast majority of cases, chronic rhinosinusitis co-exist with nasal polyposis and asthma for which various medical interventions alongwith functional endoscopic sinus surgery have favorable outcome[17].

CONCLUSION

Irrigation of maxillary sinus with metronidazole injection after antral washout procedure in patient with chronic maxillary sinusitis is very effective in early recovery from the disease.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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