Original Article

Acute Sinusitis

Management of Acute Sinusitis; Don't Forget Orbital Involvement

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ABSTRACT

Objective: To study the results of management of acute sinusitis and early detection and prevention of devastating orbital complications.

Study Design: Experimental study

Place and Duration of Study: This study was conducted at the Lahore General Hospital Lahore and Red Crescent Medical & Dental College Dina Nath, Kasur in the Departments of ENT and Eye from May 2016-May 2019.

Materials and Methods: Study included 50 cases presented with symptoms and signs of acute sinusitis as well as symptoms and signs of orbital complications or threatened orbital complications of acute sinusitis. The cases who presented with acute sinusitis were treated by antibiotics, analgesics, local nasal decongestant and systemic nasal decongestants after taking proper history and ENT examination, blood C/E, ESR, nasal swab for C/S and x-ray PNS occipitofrontal and occipitomental views. Those presenting with acute sinusitis along with symptoms and signs of threatened orbital complication were examined by Opthalmic Surgeon and CT Scan of nose and PNS were requested to type the orbital complications of acute sinusitis according to Chandlers classification. The patients aged 18-60 years were included in the study.

Results: Among 50 patients, 76.0% were males and 24.0% were female patients. They were diagnosed as having acute sinusitis clinically. Among them, 92% were treated on conventional lines.There were 8% patients suspected of threatened orbital complications as they developed odema of eyelids. Opthalmic consultation and CT Scan showed that they had type-I orbital complication according to Chandlers classification for orbital complications.They were given i/v Augmentin along with Metronidazole infusion along with the other treatment modalities given in acute sinusitis generally.Early diagnosis and aggressive medical management resulted in their recovery.

Conclusion: Acute sinusitis with orbital complications are threat to patient vision and life but are uncommon. Opthalmic consultation and urgent CT scan are mandatory if suspicion of orbital complication is arising. CT scan of nose, paranasal sinuses and orbit give guidance for surgical intervention or medical management. If acute sinusitis is diagnosed early and treated promptly and adequately, orbital complication are unlikely and orbital complications even if threatening are picked early. In collaboration with ophthalmic surgeon along with CT scan, they will also not progress to opthalmoplegia, blindness and cavernous sinus thrombosis if treated aggressively.

Key Words: Acutesinusitis, orbital, complications, Chandlers classification.

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INTRODUCTION

Sinusitis is the inflammation of paranasal sinuses and nasal mucosa. It is a frequent medical problem affecting over 24 million individuals yearly. The sinusitis could be acute (about < 4 weeks), sub-acute (4 to 8 weeks) or persistent (almost for 8 or more weeks). All 3 kinds of sinusitis have same symptoms and hence are mostly difficult to differentiate.

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Several factors are responsible for sinusitis chronicity including mucus recirculation, osteitis and ostial blockage.

Generally the acute sinusitis occurs due to common cold but dental extraction, dental infectivity, diving and swimming, trauma and nose operation are also responsible for it. The influencing factors comprise any anatomical anomalies, polyps, septal deviations, enlarged adenoids, foreign body or allergic rhinitis. Bacterial infectivity promptly follows any viral insult while streptococci, pneumococci, escherichiacoli, H. influenza and staphylococci are the bacteria held responsible.

Acute sinusitis orbital complications are rare but comprise abscess and orbital cellulites both among adults and children but remain comparatively infrequent.

Orbital septum begins from periosteum and coming up from periosteum anterior extension from orbital boundary in the eyelids, detaches eye superficial

portion (preseptalregion) from deeper structures of orbit (postseptal region).[1,2]

Acute sinusitis orbital complications are categorized through Chandler 1970 based upon medical evaluation alone like pre- & post-septal contaminations and put patients in 5 groups. The Grade-1 is Preseptal cellulitis (inflammatory edema), Grade-2: OC (orbital cellulitis), Grade-3: SPA (subperiosteal abscess), Grade-4: OA (orbital abscess), and Grade-5: CST (cavernous sinus thrombosis).[3] Though, identifying the grades among children with painful and/or swollen eyes could be further vague.[1] To make classification criteria simple, orbital septum complications comprising inflammatory edema and postseptal contaminations have been suggested. Once the sinusitis is main cause, infectivity spread mostly through ethmoid sinuses; though, infectivity can spread via maxillary antrum roof or frontal sinus floor.[1] Orbital complications could be an outcome of development of infectivity through destruction of osteitic bone, bony defects or via communicating veins thrombophlebitis.[4]

Several and varied sinus pathologies can show with orbital involvements.[5] The most frequent reason of OC is primary sinus infectivity.[6] Orbital complication comprises 74 to 85 percent of complications emerging from the acute rhinosinusitis and generally it is inferior to the acute ethmoidal sinusitis because ethmoid sinus is detach from orbit just via lamina papyracea.[7] Among developing states, sinusitis is not well treated[8] and believed a major reason regarding orbital complications.[9] Antibiotics introduction has changed the sinusitis course as well as its problem. During pre-antibiotic period, among patients mortality and morbidity caused by orbital problems secondary to the sinusitis were 17 percent and 20.5 percent, respectively. With stronger antibiotics advent and novel surgical modalities, mortality and morbidity rates have been decrease to 1-2.5% and 3-11 percent, respectively.[10]

Management plan regarding sinusitis orbital complications depends upon affection severity at early presentation.[11] Medical therapy is encouraged among mild cases with neither visual affection nor the ocular mutility restriction. Treatment failure mandate surgical intrusion managing both nearby orbit or affected sinuses.[12] Acute sinusitis is believed a serious problem due to orbital complications. Delay in diagnosis as well as proper management could affect patient vision and even it becomes most dangerous disease.[13] Therefore, present study aims to determine the modes of presentation and the outcome of different management strategies and early detection and prevention of orbital complication.

MATERIALS AND METHODS

The study was conducted in Department of ENT, Lahore General Hospital Lahore and Department of Eye and ENT in Pak Red Crescent Medical and Dental College, Dina Nath, Kasur from 2016 to 2019.

All patients aged 18 to 60 years with acute sinusitis were included in this study. Diagnosis was based on history, physical examination and investigation such asx-rays paranasal sinuses, blood C/E, ESR and nasal swabs for culture sensitivity. CT scan of nose paranasal sinuses and orbits were requested in selected cases in which there was suspicion of threatened orbital complications.

These patients were treated with antibiotics, nasal decongestant locally and systemically, steam inhalation and saline irrigation.

In four patients with acute sinusitis, where there was suspicion of threatened orbital complications as odema of eyelids developed and were brought under consultation of ophthalmic surgeon and CT scans ordered to type the orbital complication of acute sinusitis according to Chandlers classification and vigorous treatment was started with addition of i/v Augmentin Metronidazole infusion along with conventional treatment.

RESULTS

Table No.1: Gender of patients

	Frequency	Percentage
Male	38	76.0%
Female	12	24.0%
Total	50	100.0%

Table No.2: Age of patients

	Frequency	Percentage
20-25 years	13	26.0%
25-30 years	2	4.0%
40-45 years	32	64.0%
50-60 years	3	6.0%
Total	50	100.0%

Result shows that among 50 patients, 38 (76.0%) were males and 12 (24.0%) were female patients.

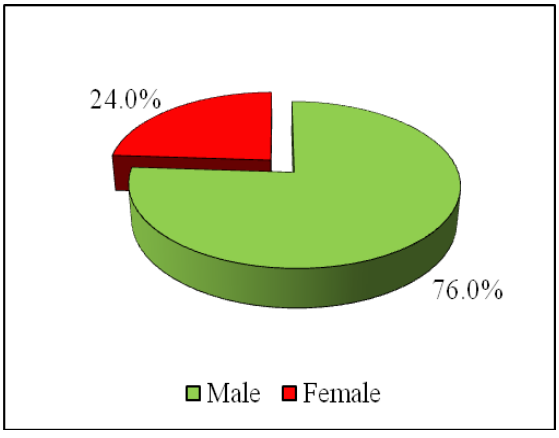

Figure-1: Gender of patients

Among 50 patients, majority 32 (64.0%) was 40-45 years old, 13 (26.0%) were 20-25 years old and 3 (6.0%) were 50-60 years old while 2 (4.0%) patients were 25-30 years old.

Orbital manifestation as swelling of eyelid in 4 (8%) patients was encountered on right side.

Forty six patients responded to antibiotic augmentin, local nasal decongestant xylometazoline, systemic nasal decongestant pseudoephedrine, steam inhalation and saline irrigation.

Four patients who developed odema of eyelids and ophthalmic consultation and CT Scan placed them in Stage-I of Chandler classification of orbital complications of acute sinusitis were treated aggressively by adding metronidazole infusion and i/v augmentin in addition to treatment given for sinusitis already.

All patients recovered with the treatment given. Their symptoms and signs disappeared, leukocyte count returned to normal, ESR returned to normal and follow up x-ray PNS showed disappearance of opacity of sinuses and return of radiolucent sinuses one month after.

DISCUSSION

In acute sinusitis the organism found are H. influenzae, staphylococcus, streptrococcus while in adult aerobic and anaerobic bacteria are important.[14,15,16] Inflammation of paranasal sinuses is one of the commonest medical problem.[17] Orbital complications not only threat vision but also life from complications such as meningitis, brain abscess and cavernous sinus thrombosis.[18]

However, orbital complications remain relatively uncommon. The location of orbital infection is described with respect to orbital septum either as preseptal (periorbital) or postseptal (orbital).[19] The distinction between these two is important because post-septal infection are treated vigorously to prevent devastating complications.

Conventional plain x-rays or paranasal sinuses can tell if one sinus is involved or there is pansinusitis. CT Scan of orbit and sinuses can help in diagnostic differentiation as well as determining which patient will benefit from surgical interference.[20]

It is to be noted that CT Scan may identify the abscess and Krohelet al. reported that an abscess developing within 24 to 38 hours may produce non specific inflammatory signs on CT and not identify as abscess.[21]Demetrios et al. found that CT Scans were to be accurate predictors of sub periosteal abscess among 80% patients.[22]

It is well known that i/v antibiotics can penetrate the abscess,[23] but without drainage their anti-bacterial activity within the abscess is poor, probably because the purulent milieu protects the micro organism by enzymatic degradation of antibiotics.[24]

In our study 4 patient belonging to stage Type-I Chandler Classification for orbital complications were treated successfully by i/v antibiotics and role of surgery was limited to those patient who did not respond to antibiotics.

Other 46 patients presenting with acute sinusitis were diagnosed early and managed adequately and did not proceed to any orbital complication.

It was noted that orbital complication can occur in acute sinusitis when there is delay in diagnosis of acute sinusitis, delay in starting proper treatment, improper selection of antibiotic, underdose, antibiotic not given according to schedule but irregularly and also not given for a proper duration. Secondly, the complications will arise if along with antibiotic, local and systemic nasal decongestant, steam inhalation and saline irrigation are not given to allow free drainage.

It wasfound that orbital inflammation is secondary to sinusitis in around 70% of cases[14,25] and maxillary, frontal, ethmoid sinuses may be involved.[26]

CONCLUSION

Orbital complications secondary to acute sinusitis are threat to patient vision and life but they are uncommon. Complete examination of ENT andeyes is required to diagnose acute sinusitis and its orbital complications. Radiology of sinuses show the sinus/sinuses affected and can be of value in follow up of cases to see whether resolution has taken place and radiolucency has restored.

CT is mandatory if orbital complications are suspected and earlier the better because it will guide that surgery is required or not. Orbital complications of sinusitis are due to ignorance, lack of awareness, under treatment on part of the patient and doctor and delayed/missed diagnosis on part of clinician.

Author's Contribution:

Concept & Design of Study:	Tariq Enver
Drafting:	Arif Hussain
Data Analysis:	Nasir Mahmood
Revisiting Critically:	Tariq Enver, Arif Hussain
Final Approval of version:	Tariq Enver

Conflict of Interest: The study has no conflict of interest to declare by any author.

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