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CLINICAL PROFILE OF ORBITAL COMPLICATIONS OF RHINOSINUSITIS IN RELATION TO AGE

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ABSTRACT

Acute RhinoSinusitis is the most common cause of orbital infections, responsible for 60-80% of such cases. Spreading of pathogens from sinuses, mostly ethmoids, to nearby tissues are thought to occur directly through bone, lamina papyracea or communicating blood vessels. This study evaluated the clinical characteristics of orbital complications of sinusitis and analysed the role of age as a factor affecting patient outcome.
This study was conducted on 27 patients with orbital complications of rhinosinusitis treated in the Department of ENT, Government Medical College, Trivandrum over a period of 6 years. Mean age was 31.3 years. 61.5% patients among children were males and 64.3% among adults were females. Apart from other clinical findings, fever was common among children. Multiple sinus involvement was common among children. Frontal sinus was the most common sinus involved in adults. Orbital complications of rhinosinusitis among children presented with higher chandler score than adults. Children responded well to medical management with complete recovery. The need for surgical intervention was higher among adults, with possibility of poor outcome associated with frontal sinus involvement.

KEYWORDS

orbital complications, rhinosinusitis, age

INTRODUCTION

Bacterial infections of the orbit subsequent to rhinosinusitis have long been associated with a risk of catastrophic local sequelae and intracranial spread. The natural course of disease as documented by Gamble (1933) in the preantibiotic era, resulted in death of 17% patients and permanent blindness in 20%. Even in present times with advances in antibiotics and in imaging techniques, post septal orbital cellulitis continues to result in permanent visual disability in about 20% and also occasionally mortality (Jackson and Baker 1986).
Considering the significant number of cases referred to our centre, this study is conducted to evaluate the clinical course and age related factor in orbital complications of rhinosinusitis.

METHODOLOGY

The computerised database of Government Medical College, Trivandrum was retrospectively reviewed for all patients admitted for orbital complications of sinusitis between March 2014 to March 2020.
According to our hospital protocol all patients are managed in consultation with the ophthalmologist.On presentation all patients were specifically assessed for lid oedema, chemosis, proptosis, ocular movements and visual acuity. An emergent CT Scan of nose paranasal sinuses and orbit was undertaken for all the patients. Diagnostic nasal endoscopy was also done .Initial presumptive antimicrobial therapy was initiated along with local decongestants. The antimicrobial regimen consisted of at least two antibiotics administered intravenously. This regimen was subsequently changed, if so indicated by lack of response to treatment or results of culture and sensitivity. Drainage of abscess was performed via external approach.This may be supplemented by endoscopic approach. Functional Endoscopic sinus surgery was done to clear disease inside the paranasal sinuses.

DATA ANALYSIS

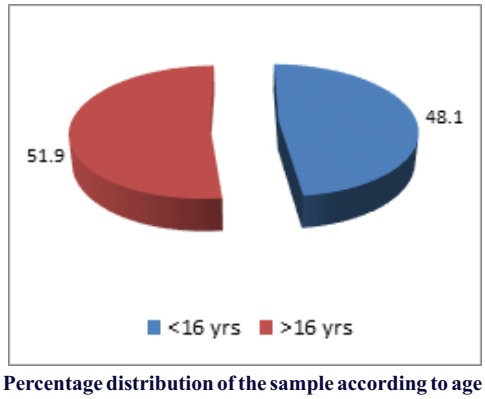

Fig 1. Percentage distribution of the sample according to age

Among 27 patients,13 (48.1%)were less than 16 years and 14(51.9%)were more than 16 years of age. Mean age was 31.3+or –24.6. 27 patients 13(48.1%) were males and 14(51.9%) were females.

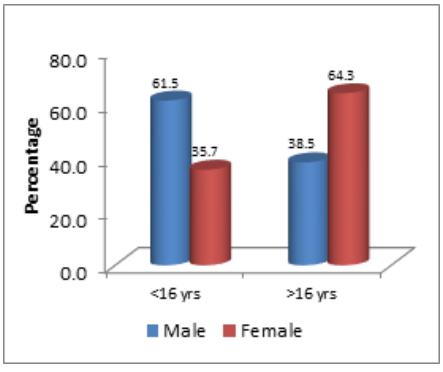

Fig 2. Distribution of age and gender

61..5% patients among children were males, whereas among adults 64.3% were females.

9 patients (33.3%) had hospital stay less than one week and 18 (66.7%) had hospital stay more than one week .Mean duration of hospital stay was 9.5 +or- 4.2 days. There was no significant difference in the duration of hospital stay between the age groups.

Most of the patients did not have any comorbidities. Two patients had otitis media,two patients had diabetes, thyroid disease,one patient each had adeno tonsillitis, allergic rhinitis, and bronchial asthma.

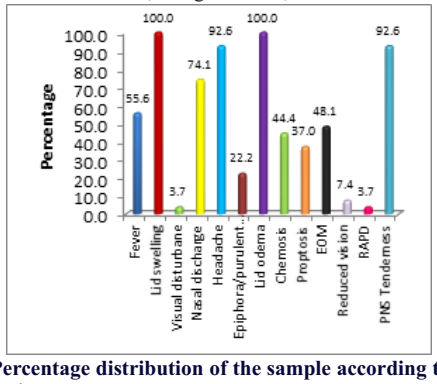

Fig 3. Percentage distribution of the sample according to clinical presentation

All 27 patients (100%) had lid swelling. 15patients (55.6%) had fever,20 cases (74.1%) had nasal discharge and 25(92.6%) had headache. On examination 12 patients (44.4%) had chemosis,10 cases (37%) had proptosis, 13(48.1%) had reduced extra ocular movements. 25 patients (92.6%) had paranasal sinus tenderness. Only 2 patients (7.4%) had reduced vision.

18 patients (66.7%) had total count >10000 and 9 patients (33.3%) had total count<10000. Mean total count was 11320. Mean ESR was 43.1+or- 29.2.

Fever and nasal discharge were common among children, compared to adults and it is statistically significant (p=0.005). There was no significant difference with regard to other clinical findings.

Table 1. Comparison of sinus involvement based on age					
Sinus	**<16 yrs**		**>16 yrs**		**p**
	Count	(%)	Count	(%)	
Single	0	0.0	6	42.9	0.010
Multiple	13	100.0	8	57.1	

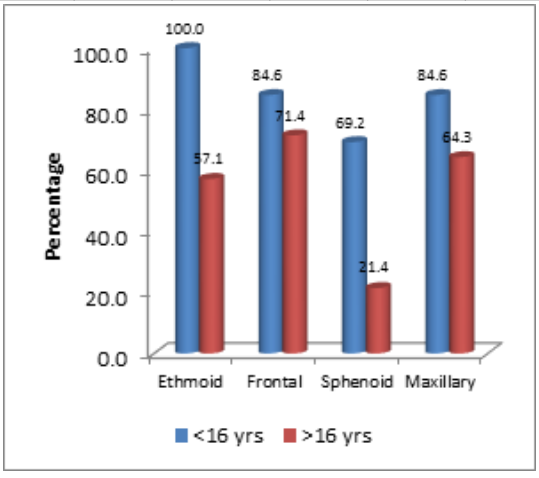

Fig 4. Comparison of sinus involvement based on age

Among children, ethmoid sinus was involved in all cases (100%) ,whereas in adults ethmoid sinus was involved only in 57.1% cases . Sphenoid sinus was involved 69.2% children, but only in 21.4%adults. This was found to be statistically significant. In adults frontal sinus was involved in 71.4% cases. All pediatric patients had multiple sinus involvement (100%) and only 57.1% of adults had multiple sinus involvement. This was found to be statistically significant (p=0.01).

Table 2. Radiological Findings And Treatment					
		<16 yrs		>16 yrs	
		Count	Percent	Count	Percent
CT scan	Preseptal cellulitis	3	23.1	10	71.4
	Orbital cellulitis	1	7.7	1	7.1
	Subperiosteal abscess	9	69.2	3	21.4
Treatment	Medical	7	53.8	5	35.7
	FESS	6	46.2	7	50.0
	FESS + External	0	0.0	2	14.3

Among the 27 patients,13 cases (48.1%) had Preseptal cellulitis, 12cases (44.4%) had subperiosteal abscess, 2 cases (7.4%) had orbital cellulitis.

Among children, 69.2% had subperiosteal abscess whereas only 21.4% of adults had the same. Preseptal cellulitis was commoner in adults (71.4%) whereas it was only 23.1% among children.

12 patients (44.4%) received medical treatment, in the form of parenteral antibiotics, 13 patients (48.1%) received FESS and two cases underwent FESS and external surgery. Systemic steroids were used in all the cases. 96.3% patients had complete recovery after treatment.

53.8% children recovered with medical treatment, compared to 35.7% in adults. Two cases of FESS combined with external surgery was done in adults.

One was a case of frontal mucocoele with orbital cellulitis and another was a case of frontal sinusitis with subperiosteal abscess. Complete recovery was seen in 96.3% of patients. Poor visual outcome was seen in the case of Frontal mucocoele with orbital cellulitis.

DISCUSSION

This study included 27 cases of orbital complications of sinusitis admitted and treated in the Department of ENT, Medical college Hospital Trivandrum from March 2014 to March 2020. We divided the patients into two groups, younger than 16 years and over 16 years of age and compared their clinical profile.

In our study, among 27 patients, 13 (48.1%) were less than 16 years and 14 (51.9%) were more than 16 years of age. Mean age was 31.3±24.6 years. Average age at presentation has been reported from19.92 to 25.7 years (Chaudhry et al,ozkurt et al). Orbital complications of sinusitis usually affects children and early adolescents, as until 15 years the immunologic system is immature.

In our study, 13 (48.1%) were males and 14 (51.9%) were females. 61..5% patients among children were males, whereas among adults 64.3% were females. Gender distribution is usually equal, however in studies from Iran, India and Nigeria, males are affected more often (66.7 -70.6%). Some studies from the developed world have also exhibited male predominance, such as a pediatric study from United states in which 73% were males (Nageswaran et al) and a study from Canada in which 74% cases were males(Le T D et al).

Nili Segal et al found in his study on 288 patients that, the average hospital stay was 5 days. The average stay for patients less than 2 years was 4 days, 6 days for patients aged 2-18 years and 6 days for patients older than 18. The difference was found to be statistically significant. In our study, 9 patients (33.3%) had hospital stay less than one week and 18 (66.7%) had hospital stay more than one week. Mean duration of hospital stay was 9.5 ± 4.2 days

Fever and nasal discharge were common among children, compared to adults and it is statistically significant (p =0.005). There was no significant difference with regard to other clinical findings. Nili Segal found that 106 patients had high temperature of which 100 were children(45.5%) and 8.8% were adults. A direct correlation was found between age and presence of high temperatures in patients with periorbital complications (p<0.001). Huang et al found similar results in a retrospective analysis of 64 pediatric patients. In a study (Nageswaran et al) clinical characteristics were compared in children younger and older than 7 years. The younger group presented higher WBC counts. In children younger than one year, orbital complications presented with fever, periorbital oedema, reduced appetite and lethargy (Miller et al).

Among series with reported orbital complications of sinusitis, the incidence of subperiosteal abscess reached 79% in older studies and is estimated to be around 42% in more recent studies. Ferguson and Macnab present incidences of 29% inflammatory changes, 62% subperiosteal abscess and 9% orbital abscess in the children group compared to 72%,5% and 22% respectively in the adult group. In our study, 69.2% children had subperiosteal abscess whereas only 21.4% of adults had the same. Preseptal cellulitis was commoner in adults (71.4%) whereas it was only 23.1% among children .

We found that among children, ethmoid sinus was involved in all cases (100%), followed by maxillary sinus(84.6%) whereas in adults ethmoid sinus was involved only in 57.1% cases. This was found to be statistically significant(p=0.01). In adults frontal sinus was commonly involved in (71.4%) followed by maxillary sinus(64.3%). All pediatric patients had multiple sinus involvement(100%) and only 57.1% of adults had multiple sinus involvement. This was found to be statistically significant (p=0.01).

Mousa victor in his study on 36 patients found that most common sinus involved in children was ethmoid, followed by multiple sinus involvement and in adults multiple sinus involvement was the most common finding.

Choudhry et al found that, childhood orbital cellulitis was found to be involving more than one sinus in upto 38% cases. And in adults, orbital involvement was related to frontal sinus infection whereas multiple sinus involvement did not exceed 11%.

Successful transnasal endoscopic surgery is reported in patients with medial subperiosteal abscesses whereas superolateral extension requires an external approach. Migirov and colleagues suggested endoscopic sinus surgery in the treatment of medial orbital abscesses. In our study, 53.8% children recovered with medical treatment, compared to 35.7% in adults.Ttwo cases of FESS combined with external approach were done in adults. The indications of surgery were inadequate response to medical treatment, progressive proptosis or

ophthalmoplegia, any degree of visual loss and definitive signs of abscess formation on CT. In our study, all but one patient showed complete recovery with treatment.

CONCLUSION

In our six year study we found that in orbital complications of rhinosinusitis among children, males were predominantly affected. Fever and nasal discharge were common in children, compared to adults. Multiple sinus involvement was the commonest finding among children and ethmoid sinus was the most common single sinus involved. Frontal sinus was the most common sinus involved in adults. Orbital complications of rhinosinusitis in children presented with higher chandler score than adults. The younger age group responded well to medical management with complete recovery whereas need for surgical intervention was found to be higher among adults, with chances of poor outcome associated with frontal sinus involvement.

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