

COMPLICATIONS OF PAEDIATRIC RHINOSINUSITIS IN A TERTIARY CARE HOSPITAL

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Abstract

Background: Patient characteristics, risk factors, and treatment options are important to consider in the management of complications of rhinosinusitis in paediatric patients.

Aim: This study clinical profile, frequency of complications and treatment of all paediatric patients with complicated rhinosinusitis.

Methods: This study is a retrospective review of the paediatric patients from 2009 to 2014 who presented at the otorhinolaryngology clinic in a Nigerian tertiary hospital with complicated rhinosinusitis.

Results: Eleven patients were identified with complications. Patients were mostly (81%) between the ages of 10 and 15 years and male gender (M/F, 1.2:1). Seven patients (63.6%) presented to the clinic between the months of November and January. However, only 4(36.3%) patients had a background history of allergy. Most patients (36.3%) presented within the first week of onset of symptoms. X-ray was the commonest radiological investigation done to establish diagnosis (36%), only two patient had a CT for diagnosis. Most common complication was orbital (63.6%) and occurred more in patients between ages

10 and 15 (75%) while only 2 patients (18.2%) had intracranial complication. Majority were managed surgically, the others (36.4%) had conservative treatment.

Conclusion: Very few patients presented with complications during the period under review. Orbital complications are more common than other forms of complications.

Keywords: Paediatric, rhinosinusitis, complication, Nigeria

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INTRODUCTION

Rhinosinusitis is defined as a symptomatic inflammatory condition of mucosa of the nasal cavity and paranasal sinuses, the fluids within these sinuses, and/or the underlying bone [1]. The term “sinusitis” has been replaced mostly by “rhinosinusitis” due to radiographic evidence that the nasal mucosa is almost universally involved in the disease process.

It is a widely prevalent disease affecting more than 14% of adults and children [2]. It is often overlooked especially in children because the symptoms in children are limited and can be very similar to the common cold or allergic symptoms. Thus, a high index of suspicion is necessary to make the diagnosis of rhinosinusitis in these children as it has high propensity to become chronic, however, its complications are unusual but can carry a high morbidity and

mortality rate [3]. Rhinosinusitis in itself is a complication of upper respiratory infections which are the most common illnesses evaluated by the primary care paediatrician. About 5–13% of upper respiratory tract infections in children results into acute rhinosinusitis [2]. Though not life threatening, it profoundly affects child's school performance and sleep pattern. If untreated, it could progress to chronic rhinosinusitis (CRS).

Generally, the complications of rhinosinusitis usually are related to the local region of the affected sinus, and are classified as local (osteomyelitis of the frontal bone or maxilla), orbital, and intracranial complications. The most common complication is the orbital type (60–75%) as the paranasal sinuses are closely related to the orbit, followed by the intracranial (15–20%) and the local type (5–10%). Some studies also report cranial nerve(s) in the posterior ethmoid or sphenoiditis, which did not occur with the orbital or intracranial type [4].

The mean age of 3 to 6 years reflects the greater prevalence of orbital involvement while intracranial complications occur more frequently in adolescents [5].

The treatment options of these complications in modern era are frequently debated, whether conservative/medical, surgical or combined. Surgical options include both endoscopic and open surgery.

This aims to review the clinical profile, frequency of complications and treatment of all paediatric patients with complicated rhinosinusitis who presented at the otorhinolaryngology clinic of our Department.

MATERIAL AND METHODS

The hospital records of paediatric patients managed for complications of rhinosinusitis in the Department of Otorhinolaryngology, Obafemi Awolowo University Teaching Hospitals

Complex between the years 2009 and 2014 were reviewed. Demographic data, type of complication, duration of symptoms before presentation and treatment were evaluated.

RESULTS

Eleven patients were identified with complications of rhinosinusitis out of 26,144 paediatric patients seen within that same period given an incidence rate of 0.04%. Patients were usually between the ages of 10 and 15 years (81%), of male gender (M/F, 1.2:1), and 63.6% presented to the clinic between the month of November and January (Table 1). Only 4 patients had a background history of allergy (36.3%). Most patients (36.3%) presented within the first week of onset of symptoms (Table 2). X-ray was the commonest radiological investigation done to establish diagnosis (36%), however 6 patients did not have any radiological investigation done and 2 patients had a CT diagnosis. This is due to financial constraints since patient had to pay out of pocket. Most common complication was orbital (63.6%) and occurred most in patients between ages 10 and 15(75%) while only 2 patients (18.2%) had intracranial complication (Table 3). Seven patients (63.6%) had surgical intervention, others were treated conservatively with intravenous antibiotics. All patients recovered with good outcome.

Table1: The Month of Presentation at the clinic

	Frequency	Percentage
JAN	2	18.2
FEB	1	9.1
APR	1	9.1
MAY	1	9.1
AUG	1	9.1
NOV	5	45.4
Total	11	100.0

Table 2: Duration of symptoms at presentation

	Frequency	Percentage
<1/52	4	36.3
1/52 - <1/12	2	18.2
1/12 - 3/12	2	18.2
>1YR	3	27.3
Total	11	100.0

Table 3: Type of Complications of Rhinosinusitis

Complications	Frequency	Percentage
PRESEPTAL CELLULITIS	2	18.2
ORBITAL CELLULITIS	2	18.2
ORBITAL ABSCESS	2	18.2
INTRACRANIAL ABSCESS + ORBITAL ABSCESS	1	9.1
MUCOCELE	3	27.2
INTRACRANIAL ABSCESS	1	9.1
Total	11	100.0

DISCUSSION

Although complications of rhinosinusitis are less common but they still continue to occur despite the worldwide availability of antibiotics. These complications can have fatal sequelae and do not always result in a complete recovery.

Males were more affected than females, which is similar to studies by DeMuri et al and Radovani et al [5,6]. In this study our findings correlate well with the previous studies which reported that one of the most common complications of acute rhinosinusitis is orbital. Orbital

complication of acute rhinosinusitis typically affects children and young adults [7], but delayed diagnosis in all age groups is a threat to both vision and life [8] and are therefore regarded as medical emergencies. The orbital complications are preseptal cellulitis, orbital cellulitis, orbital abscess, subperiosteal abscess [9]. It may lead to optic nerve compression, panophthalmitis, and cavernous sinus thrombosis. Infection spread to the orbit either from direct extension or defect in the thin wall of the paranasal sinuses (especially lamina papyracea), local thrombosis, and direct extension of preseptal cellulitis through the orbital septum or haematogenous seedlings. The topographic anatomy of the orbit, which shows intimate relations with paranasal sinuses, provides a convincing explanation to these events. The lamina papyracea, which divides the orbit from the nasal space, is a thin layer of bone. Inside it are multiple thin blood vessels, which allow the spread of aggressive infection in the orbit. Inside the orbital vessels is where the palpebral vessels and those of the centre of the face drain and travel parallel with the lamina papyracea toward the sinus cavernosus. None of these vessels contain valves; therefore, there is an accelerated spread of infection.

Only two patients (18.2%) presented with intracranial abscesses. Intracranial extensions of rhinosinusitis are infrequent in the antibiotic era, and occur in about 4% of patients hospitalized with acute or chronic rhinosinusitis [10]. This is however the second most common complication of acute rhinosinusitis. Intracranial complications include epidural empyema, subdural empyema, sagittal sinus and cortical vein thrombosis, brain abscess and meningitis. Even with aggressive management, intracranial complications have a 10% to 20% mortality rate [11], both patients with intracranial complications in this study survived with good outcome.

A higher frequency of presentation was seen between November and February similar to what was reported by Sijuwola et al [12], DeMuri and Wald also reported that the peak prevalence of complications of acute bacteria sinusitis occurs in the winter months [5]. This

may be due to the dry and windy weather during this period associated with dryness causing irritation leading to inflammation and nasal obstruction with subsequent rhinosinusitis.

X-rays as a basis of diagnosis was used in four (36%) patients due to financial constraints, six others could not even afford any radiological investigation. Radovani et al also reported x-rays as a basis of diagnosis however other studies used gold standard, computed tomography predominantly as the basis of diagnosis while Reid reported that there is no role for plain radiography in evaluation of complications of acute rhinosinusitis [13].

All the patients except those with orbital cellulitis were treated by combination surgery and intravenous antibiotics while others were treated conservatively. Radovani et al also showed that young patients, especially children, respond better to conservative treatment of orbital complications, especially when most present with preseptal cellulitis which correlates with this study. All patients had a good outcome.

CONCLUSION

Very few patients presented with complications during the period of this study. The orbital complications were the most common type of complications. Pre-teen male patients were found to be at highest risk for complications of rhinosinusitis.

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