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CHRONIC RHINO SINUSITIS PRESENTING WITH RECURRENT MENINGITIS

Paediatrics

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ABSTRACT

Recurrent bacterial meningitis is an uncommon but life-threatening condition. Common causes in children include congenital or acquired defects involving cranium or spine, immunodeficiency disorders. Although rarely chronic parameningeal infections like sinusitis, otitis media and mastoiditis can cause recurrent bacterial meningitis. Here, we are discussing a case of similar interest.

KEYWORDS

Meningitis, Recurrent, Sinusitis.

Clinical uses in children

15 years old male child presented with one day history of fever, headache, vomiting, peri orbital swelling over right side, generalized seizures and altered sensorium. On examination, GCS was 5/15; meningeal signs with features of raised ICT. No focal neurological deficit was noticed. Fundus examination was normal. On investigation, there was leucocytosis with predominant polymorphs. Mantoux and gastric aspirate for AFB were negative. He was diagnosed as meningoencephalitis (proven by CSF analysis: TLC 385 cells, DLC P22 % ; L78% , protein 102 mg/dL, sugar 68 mg/dL, [corresponding blood sugar - 220 mg/dL] Gram staining, culture and latex agglutination - Negative). Child required mechanical ventilation and vasopressor support, along with IV ceftriaxone, vancomycin, antiepileptic, steroid and mannitol. Antibiotics were continued for 14 days. Imaging of brain, orbit or sinuses could not be done due to non availability. Child improved clinically and was asymptomatic at the time of discharge.

Two months after discharge, he again presented with acute onset of fever, headache, vomiting, periorbital swelling over right side, generalised seizures and altered sensorium for one day. There was history of recurrent sneezing on exposure to cold or dust without any history of ear discharge or trauma. There was no history suggestive of recurrent infections (LRTI, furuncles, boils, UTI, Oral ulcerations, diarrhea and fever). On examination, child's GCS 8/15, meningeal signs were present, with periorbital and irregular maxillary swelling over right side of face. No craniovertebral anomalies, no scars or sinuses were present. Features of raised ICT were present without any evidence of focal neurological deficit. Fundus examination was normal. Investigations revealed high TLC of 34300 cells with predominant polymorphs, CSF TLC 305 cells, P78%; L 22%, Protein 274 mg/dL, sugar 12 mg/dL, Gram staining and culture were negative. Blood culture was sterile. MRI brain and orbit showed 1) T1 hypointensity, T2 & FLAIR heterogeneous hyperintensity in right maxillary sinus extending into right osteomeatal complex , right nasal cavity posteriorly and right frontal sinus which is closely abutting right inferior orbital wall. Possibilities entertained were fungal sinusitis/ sinonasal mass. 2) T1 hypointensity in right superior orbital region and right superior oblique muscle with heterogenous enhancement – possibly orbital cellulitis. 3) Well defined hypointense lesion with central hyperintensity in left caudate nucleus – possibly neurocysticercosis. 4) T1 hyperintensity in the meninges – sequelae of meningitis (Fig 1). Immunological profile was planned but could not be done. Child was given IV meropenem, vancomycin, mannitol and inj. dexamethasone. His sensorium and peri orbital swelling improved in one day and meningeal signs disappeared in 4 days. Antibiotics were continued for 14 days with albendazole for 28 days. Sinus endoscopy was done which revealed chronic allergic rhinosinusitis with expansile mass lesion without any bony defect. He was started on intranasal corticosteroids, with oral antihistamines. Repeat MRI was done which was normal. Child was discharged and was on regular follow up.

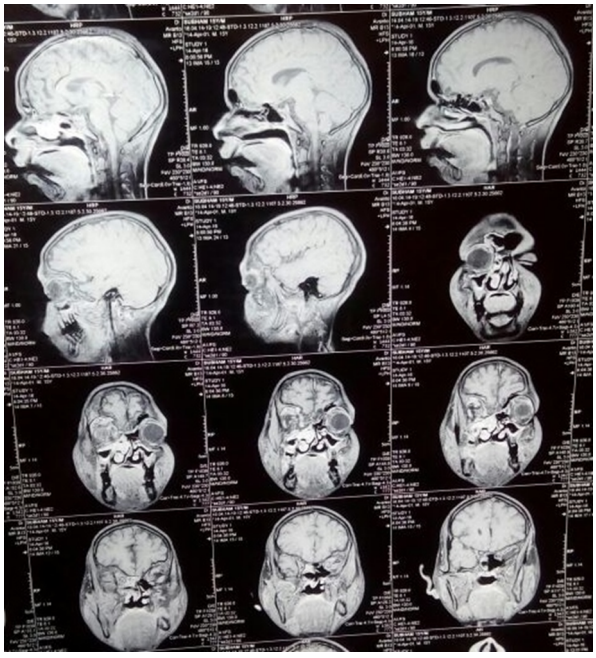

Fig.1. MRI Brain - T2 **heterogeneously hyperintensity right maxillary sinus extending into right osteomeatal complex and right nasal cavity posteriorly**

Discussion

Recurrent bacterial meningitis (RBM) results from a different bacterial pathogen than the first, or if resulting from the same organism but occurs more than three weeks after the completion of therapy for the initial episode.[1] Developmental and traumatic anatomical defects are fundamental underlying causes of RBM. Patients with immune disorders e.g. immunoglobulin deficiency, complement deficiency and hyposplenia are at increased risk of RBM.[2]

Parameningeal infections, which primarily include sinusitis, otitis media and mastoiditis, can result in central nervous system infections by continuous spread through bony layers and the periosteum of the skull and, via the hematogenous route. The most common complication of paranasal sinusitis is orbital cellulitis, followed by intracranial infection in adult population.[3,4] There are two paths of infectious spread from the paranasal sinuses to the intracranial cavity which includes retrograde thrombophlebitis through diploic veins of the skull and ethmoid bone or communicating veins and direct extension of disease through anatomic pathways, such as congenital or traumatic dehiscences, sinus wall erosion, and existing foramina. A large study on 649 cases of acute or chronic sinusitis reported that 3.7% of the patients developed intracranial complications comprising frontal lobe abscess (46%), meningitis (29%) and subdural empyema

(8%).[3] Chronic parameningeal infections causing RBM usually present later in adulthood period. However, there were reports suggesting 4 cases of chronic sinusitis with presentation in childhood.[5, 6] Treatment of underlying cause remains the mainstay of treatment. Giannoni C, et al reported that out of 409 children with intracranial complications 10 children had infections secondary to sinusitis, of which 3 children had meningitis. These children were treated with endoscopic sinus surgery if medical therapy failed.[7] Giannoni CM, et al reported that 3 patients out of 203 patients had meningitis as a complication of sinusitis. These patients were treated with IV antibiotics for meningitis and endoscopic sinus surgery for sinusitis.[8]

Conclusion

All children with recurrent meningitis without an obvious cause should undergo cranial imaging studies including paranasal sinuses and sinus endoscopy to exclude parameningeal infections. Early diagnosis and treatment of rhinosinusitis is vital to prevent complications like recurrent meningoencephalitis.

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