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Case report

Methicillin Resistant Staphylococcus Aureus [MRSA] Orbital Cellulitis In A 9 Day Old Neonate: A Case Report

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ABSTRACT

Aim : To report a case of Methicillin Resistant Staphylococcus Aureus [MRSA] Orbital Cellulitis in a 9 day old neonate. Methods : A 9 day old female baby presented with sudden onset of fever associated with swelling of the left eyelids and swelling of the left ankle joint. Physical and laboratory findings were suggestive of Methicillin Resistant Staphylococcus Aureus (MRSA) orbital cellulitis of left eye with septic arthritis of left ankle joint. Computer tomography showed evidence of orbital cellulitis with ethmoidal sinusitis. The baby was started on Inj Vancomycin and Inj Gentamycin. As there was no response to antibiotic therapy for 72 hours and the condition worsened, an orbital biopsy was done which yielded heavy growth of MRSA. Results : As the organism isolated was sensitive to the drugs already administered the same treatment was continued. The neonate responded to the treatmentand was discharged after six weeks. Conclusion : Orbital cellulitis is extremely uncommon in neonates and with emergence of MRSA as one of the causative organism, it should be aggressively managed and followed up due to the significant complications associated with this condition.

1. Introduction

Orbital cellulitis in neonates is a potentially lethal condition that can result in significant complications including blindness, cavernous sinus thrombosis, meningitis, subdural empyema and brain abscess [1]. As it has the potential for giving rise to life and sight threatening complications, it requires prompt diagnosis and intervention. 60-80% of orbital infections originate from the sinuses with acute sinusitis accounting for 21% of all pediatric antibiotic prescriptions [2, 3, 4].

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The orbital septum divides the soft tissues of the eye into preseptal space and postseptal space. Preseptal cellulitis occurs anterior to the orbital septum and results from trauma, contagious infections or primary bacteremia among young infants. Orbital cellulitis, is a term reserved for infections behind the orbital septum which may or may not spill over to the lids. It usually occurs as a complication of acute or chronic sinusitis [5].

Orbital cellulitis in neonates is extremely uncommon with not more than 10 cases being reported [6]. Amongst these, orbital cellulitis due to MRSA is a rare occurrence. We are hereby reporting a case of a 9 day old female baby with MRSA orbital cellulitis secondary to ethmoidal sinusitis.

2.Case Report

A 9 day old female baby was admitted to our hospital with fever of 6 days duration associated with swelling of left eyelids and left ankle joint. The baby was born at another hospital at full term by elective caesarean section after an uneventful pregnancy. At birth, the body weight was 3000 gms and no abnormalities were found on physical examination. On the 3rd day of life, baby developed high grade fever with swelling of left eyelids. The baby also had one episode of epistaxis. Redness and swelling of left ankle joint was noticed on the 5th day. The baby was treated at a primary health centre and as the condition did not improve, it was referred to our hospital for further management.

On physical examination the child was irritable and crying. The body temperature was 101°F, heart rate was 146/min, respiratory rate 46/min. There were decreased movements of the left lower limb associated with edema of the left ankle joint.

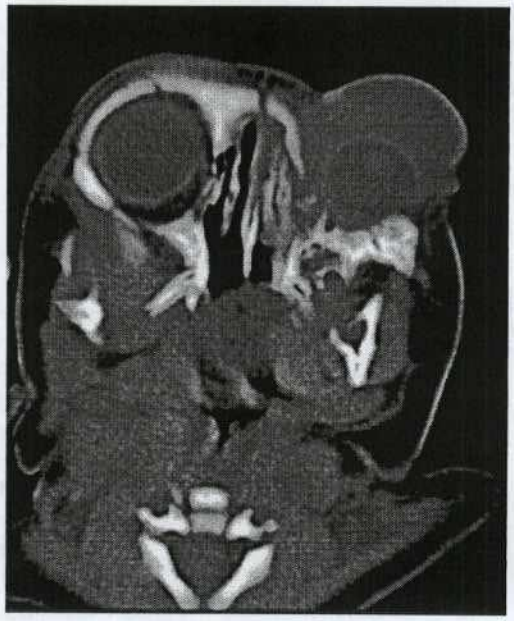
Ocular examination revealed severe edema of the left upper and lower eyelids [Figure 1].The eye was proptosed. Skin over the lids was erythematous. Conjunctival congestion and chemosis was present. The cornea was clear. Fundus and ocular movements was difficult to assess due to lid edema .The right eye was normal. Orthopaedic opinion was taken for the left ankle joint. A diagnosis of orbital cellulitis of left eye with septic arthritis of left ankle joint was made. The baby was started on Inj. Ceftriaxone 50mg/kg/dose I.V.12hrly and Inj Amikacin 7.5mg/kg/dose I.V.12hrly for 3 days until found resistant.

Figure 1: Neonate with orbital cellulitis of left eye.

Haematological investigations included hemoglobin 13.3gm/dl, total count - 19800/mm^3, RBC- 3.66million/mm^3 , platelets - 411000/mm^3 . Blood culture and sensitivity showed MRSA gram positive cocci in pairs sensitive to Vancomycin, Gentamicin, Chloramphenicol, Tetracycline, Linezolid. The baby was then started on Inj. Vancomycin 40mg/kg/dose I.V 8hrly and Inj Gentamicin 2.5mg/kg/dose I.V 8hrly.

CT scan showed extensive preseptal soft tissue oedema on the left side involving both upper and lower eyelids. There was soft tissue oedema in the inferior and inferomedial aspect of the left orbit, predominantly in the extraconal location. The left ethmoidal aircells showed soft tissue opacification indicative of sinusitis [Figure 2].

Figure 2: Axial C.T. showing extensive soft tissue involvement of left orbit with opacification of left ethmoidal aircells.



As there was no response to systemic antibiotics for 72 hours and the periorbital edema increased, an orbital biopsy was done under general anaesthesia to rule out other coexisting gram negative or fungal infections. Orbital biopsy yielded 200 grams of grey white soft tissue. Histopathology showed fragments of necrotic tissue with neutrophilic infiltrates. There was no evidence of granuloma, malignancy or fungal infections. Culture and sensitivity of the biopsy material showed heavy growth of Staphylococcus MRSA which was sensitive to the antibiotics given. Hence the same antibiotics were prescribed for a period of 6 weeks. Signs of orbital cellulitis and arthritis regressed in two weeks and the baby was discharged after 6 weeks.

3.Discussion

The commonest etiology of orbital cellulitis is extension from the adjacent periorbital structures. Upto 90% of all cases of orbital

cellulitis are caused by spread of infection from the paranasal sinuses with ethmoidal sinus being the commonest followed by maxillary, frontal and sphenoidal sinuses [7].The mean age of children admitted due to orbital cellulitis secondary to sinusitis has been reported to be between 4-14 years [1,3,4]. Pediatric literature published since 1987 have documented orbital cellulitis to commonly present at a mean age of 12 years with neonates being very rare, as seen in our case.

There is also a noticeable shift in the emergence of orbital cellulitis in infants and preschool children.

The etiological agents in orbital cellulitis are predominantly bacterial. In children less than 5 years of age infections due to Haemophilus influenzae have to be thought of, as it is the commonest pathogen residing in the paranasal sinuses. The other common pathogens in young children are Staphylococcus aureus, Staphylococcal epidermidis, Streptococcus pneumoniae and Moraxella catarrhalis. In older children gram negative organisms are more common. Cruz et al in 2001 reviewed 8 cases of neonatal orbital cellulitis all of which occured secondary to staphylococcal infection of the ethmoid sinus. This is similar to the organism isolated in our case [8].

Neonatal staphylococcus infection of the ethmoid labyrinth probably results from the interaction of three different factors: (1) the embryology of the ethmoidal cells (2) the epidemiology of staphylococcal colonization after birth (3) the way the defense mechanisms against staphylococcal infections operate in neonates.

Neither cell mediated nor humoral immune responses are fully developed in neonates resulting in increased risk of infections [9]. Usually healthy term newborns become colonized with normal flora acquired from their mothers and the environment within few days after birth. Staphylococcus aureus colonization of skin and mucosal surfaces is common [10].

Phagocytosis function of the polymorphonuclear leukocytes, which is one of the main factors involved in host defense mechanism against staphylococcal infection, is also not mature immediately after birth [11]. These factors increase the vulnerability of infants to infections.

The clinical picture which includes the classical signs of cellulitis such as eyelid swelling, erythema, chemosis, proptosis, & ocular motility impairment is highly indicative of an infection within the orbit. Diagnosis of orbital cellulitis is mainly on clinical grounds. The laboratory evaluation should include a complete blood count, blood culture, gram stained smears and cultures from conjunctiva, nose and throat. CSF analysis should be undertaken to rule out meningitis. Imaging studies like ultrasound and computed tomography should be done to rule out subperiosteal abscess and should also be done when physical examination is hampered by marked lid edema or there is no response to antibiotics or when surgical drainage is indicated.

Majority of cases can be managed medically. One series of orbital cellulitis in pediatric literature describes good clinical outcome with medical management alone in 9 children under the age of 5 years [12]. The initial treatment of orbital cellulitis in infants include a high dose of intravenous third generation Cephalosporins like Ceftriaxone, Cefotaxime, or Ceftazidime combined with a Pencillinase resistant penicillin. Surgical management is indicated to drain out a subperiosteal abscess or when other coexisting gram negative or fungal etiology is suspected. In a study by McKinley et al sinus and orbital aspirates yielded the highest number of positive cultures, though these invasive surgical procedures were performed only when indicated [13].

Methicillin Resistant Staphylococcus Aureus is fast becoming a problem in paediatric settings especially SNICU. Community-associated (CA-MRSA) and health care - associated (HA- MRSA) are the two common aetiological strains. Vancomycin has proven to be the drug of choice according to Henry Ford Hospital Study and thus has been used in our case [14]. Linezolid and Daptomycin are the other drugs which can be used.

Testing patients for MRSA upon admission, isolating and decolonization of the patient, aggressive management, maintenance of hygiene by using alcohol hand rubs is the best practice protocol for MRSA infections in NICU.

4.Conclusion

Orbital cellulitis is extremely uncommon in neonates and with emergence of MRSA as one of the causative organism; it should be aggressively managed and followed up. Particular attention should be given while choosing an antibiotic therapy due to the increased risk of tissue invasion and drug resistance of this organism. Prompt reporting of such cases along with investigation of the pathological strain and standard drug regimens will help in curbing the emergence of MRSA infections in all age groups.

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