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Mini Review

Salmonellosis an Overlooked Cause of Late Onset Sepsis in New Borns

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Abstract

Salmonellosis is a rare cause of late onset neonatal sepsis in neonates. Presentation varies from mild clinical symptoms to life threatening shock leading to mortality and morbidity [1]. The mode of transmission of neonatal *Salmonella* is still not known and has been postulated to be both vertical and horizontal and sometimes exogenous sources [2]. The diagnosis of *Salmonella typhi* is made by growth of the organism in culture as Serum Widal test is not helpful in diagnosis [3]. The management includes supportive care and intravenous antibiotics.

Keywords: *Salmonellosis; Late Onset Sepsis; New Borns*

Introduction

Incidence

Late onset sepsis is inversely related to maturity and varies between 0.61% to 14% globally among hospitalized newborn babies. Data on low-birth-weight neonates showed that predominant pathogen of neonatal late onset sepsis is coagulase negative *Staphylococcus*, followed by gram negative bacilli and fungi. Late onset sepsis is associated with postnatal nosocomial infection or community environment with peak incidence between 10th and 22nd day of life [4].

Clinical manifestations

However, *Salmonella* is rare cause of sepsis is newborns, several case reports have been published as neonatal sepsis caused by *Salmonella typhi*. The incubation period is 48 hours to 7 days. The presentation of *Salmonella* bacteremia varies from anorexia, lethargy, irritability, pyrexia to sepsis and shock. Brain abscess, meningitis and neonatal cholecystitis has been reported with *Salmonella* but mainly from non-typhoidal strain [5]. West., *et al*. reported neurological manifestation of *Salmonella* infection affecting brain ranging from ventriculitis, meningitis, subependymal effusion, abscess and intracranial bleed [6]. *Salmonella* also causes osteomyelitis and arthritis in neonates. Mortality is high up to 30% in *Salmonella* sepsis [7]. Non typhoidal species have been reported as outbreak in nurseries through thermostats and resuscitation equipment [8].

Transmission

Organism is transferred mainly as contamination from feces and oral route. There has been a report of *Salmonella typhimurium* from source of pooled expressed milk [9,10]. Mother can be investigated as cause of transmission, breast milk, blood culture and stool culture can help to trace the contact.

Diagnosis

Diagnosis of *Salmonella* includes complete blood count, increased absolute neutrophil count, increased lymphocyte count, increased c reactive protein. Other investigations like urine analysis, renal and liver function tests are supportive. Blood culture, CSF culture and stool culture is positive in most of cases. Widal test is not significant in newborns. Radiological investigations like cranial ultrasound and MRI brain can be helpful. Hearing test should be performed to exclude neurological involvement.

Treatment

Treatment is supportive and focused. Baby needs stabilization if septic shock. Intravenous fluids and ionotropic drugs for hemodynamic stability. Intravenous antibiotics like amoxicillin, ampicillin, third generation cephalosporin are used for treatment of *Salmonella* infection. Duration of treatment varies from 1 to 3 weeks depending upon severity and organ involved.

Conclusion

Salmonella sepsis is challenging in newborns as this is rarely seen in neonatal intensive care units and newborn nurseries. Salmonellosis is not usually included in causative organism of late onset sepsis, however literature review has reported two major forms of *Salmonella* infection, first sepsis neonatorum and other is asymptomatic carrier. Early recognition of *Salmonella* infection is important as blood isolates are intrinsically resistant to aminoglycosides. The key to diagnosis is sending blood culture before starting antibiotics. Hand hygiene, hand washing technique and unit protocols should be strictly followed. Parents visiting units and nurseries should be aware of hand hygiene protocols of unit.

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