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Case Report

Microbiology Section

Early Onset Neonatal Septicaemia Caused by *Pantoea agglomerans*

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ABSTRACT

Pantoea agglomerans is an opportunistic pathogen causing infection in the immunocompromised patients. It is a plant pathogen and a rare human pathogen causing neonatal sepsis, joint infection, urinary tract infection and bloodstream infections. Neonatal Gram negative septicaemia may have an unusual presentation of subtle generalised neonatal seizures without any other cardinal features of sepsis. An appropriate diagnosis is therefore the key to proper management. *P. agglomerans* being an unusual cause of neonatal sepsis should be diagnosed early with proper antibiogram for clinical cure. Here, we report a case of neonatal sepsis caused by *P. agglomerans* in a tertiary care hospital in Eastern India.

Keywords: C-reactive protein, Neonatal seizure, Thrombocytopenia

CASE REPORT

A two-day-old male neonate presented with recurrent subtle generalized clonic seizure in the neonatal ICU of a tertiary care 350 bedded hospital in Kolkata. He was delivered by caesarean section in our hospital with the indication of cephalopelvic disproportion in a post-caesarean mother with no other medical illness. The baby was the second child in a non-consanguineous marriage born in 36 weeks 2 days. He had birth weight of 2.45 kilograms and APGAR score of 9 and 10 at 1 minute and 5 minutes post-delivery respectively.

The baby was doing well on the first day after birth. On the second day he presented with recurrent generalised clonic seizure. On examination, his reflexes and sucking were fair in the interictal phase.

On investigation, serum glucose (88 mg/dl) and CSF glucose (72 mg/dl), calcium (5 mg/dl), sodium (138 meq/L) and potassium (3.8 meq/L) were within normal range. His haemoglobin was 16 g/dl, total lymphocyte count (TLC) was 13800/ µL and neutrophil 34%. He was put on intravenous phenobarbitone. An USG of brain did not reveal any abnormality. Blood culture was sent on the same day by using the automated blood culture system BacT/Alert-3D (bioMérieuxInc, France). While report of the culture was awaited, in the day-1 of ICU, the C-reactive protein (CRP) was found to be raised to 30 mg/dl, and intravenous cefotaxime (50mg/Kg TDS) and amikacin (15 mg/Kg OD) was initiated. On the Day-2 evening, provisional report of blood culture was obtained, which was found to be positive within 0.48 days of incubation and a Gram stain finding of plenty monomorphic Gram negative bacilli was reported. While the actual bacterial identification and susceptibility profile was awaited, on the day-3, he developed thrombocytopenia (platelet count 30,000/ml) and the child was put on meropenem (20 mg/Kg BD), intravenous immunoglobulin (0.5 g/Kg OD) and group matched packed platelet concentrate.

In the laboratory, once the blood culture was found to be positive for Gram negative bacilli, in day-2 it was subcultured on blood agar, chocolate agar and MacConkey agar. After overnight incubation light yellow coloured non-haemolytic colonies were seen on blood agar and non-lactose fermenting colonies were seen on MacConkey agar. The organism was identified as *P. agglomerans* on the 3rd day, by the Vitek-2 system (bioMerieux Inc, France) and also showed characteristic reactions by conventional biochemical methods including catalase positive, oxidase negative, glucose, mannitol, rhamnose and arabinose utilizing, urease negative, lysine and ornithine were not decarboxylated and Voges-Proskauer test positive.

Antibiotic susceptibility was performed by both disc diffusion method on Mueller Hinton agar and Vitek-2 system and interpretation was done according to the Clinical Laboratory Standards Institute (CLSI) guidelines (M100-S25) version 2015.

The isolate was susceptible to amoxicillin/clavulanic acid, piperacillin/tazobactam, ceftriaxone, cefepime, ertapenem, meropenem, imipenem, amikacin, gentamicin, ciprofloxacin, cotrimoxazole and colistin.

Sensitivity was reported to the clinicians on day-4 of the admission of the child to the ICU. The clinician decided not to deescalate from meropenem despite of the antibiogram, as the patient was doing well.

Seizures subsided and the platelet counts started to recover from day-7. The child was discharged in a stable condition on the 11th day.

DISCUSSION

The genus *Pantoea* belongs to the family *Enterobacteriaceae*, contains different species like *P. agglomerans, P. ananatis, P. citrea, P. dispersa, P. punctata, P. stewartii* and *P. terrea*. *Pantoea agglomerans* was formerly known as *Enterobacter agglomerans* or still earlier as *Erwinia herbicola* [1]. *Pantoea* can be isolated from feculent material, plants and soil [2]. It is an opportunistic human pathogen, reported to cause septic arthritis, synovitis, osteitis, cholelithiasis, occupational respiratory infections, skin allergy and blood stream infections particularly in association with the contamination of intravenous fluids and their contaminated closures, parenteral nutrition, anaesthetic agent propofol, blood products, and transference tubes used for intravenous hydration, both sporadically or in outbreaks [1,3].

In 2005, Habshah et al., and Van Rostenberghe et al., reported a same outbreak of neonatal sepsis among eight neonates by *Pantoea* spp transmitted through contaminated Parenteral Nutrition (PN) solutions from a tertiary care hospital of Malaysia. The organism was susceptible to most antibiotics, but in vitro therapeutic response was very poor with an excessive case fatality rate of 87.5%. Most of the patients (75%) developed thrombocytopenia within the second day of presentation, which progressed to pneumonia, acute respiratory distress syndrome

and disseminated intravascular coagulation. Remarkably, both of the articles reported the same outbreak in two journals [4,5]. The present child in our case, presented with generalised clonic seizure and thrombocytopenia. From India, there are only three reports of neonatal sepsis by *Pantoea* species. Mehar V et al., reported two cases caused by *Pantoea dispersa* from Madhya Pradesh [6]. Mahapatra et al., reported a series of five cases of neonatal sepsis caused by *Pantoea* spp. [7]. Tiwari et al., reported a case caused by *Pantoea* spp [8]. To the best of our knowledge, this is the fourth report of neonatal sepsis by *Pantoea spp* from India.

Panknin et al., also reported *Pantoea* infections caused by contaminated infusion solutions in newborn infants [9]. Another report by Mardaneh et al., showed that powdered infant formula milk contained *P. agglomerans* [10]. In the present case, no such association could be found.

Aly et al., reported five and Lalas et al., reported one case of neonatal sepsis caused by *P. agglomerans* in preterm infants [11,12]. In this case neonatal sepsis caused by *P. agglomerans* was found in a late preterm low birth weight baby.

Pantoea spp. causing neonatal infections is mostly sensitive to commonly used parenteral antibiotics. In the eight cases reported from Malaysia, the isolates were susceptible to gentamicin, netilmicin, amikacin, piperacillin, piperacillin/tazobactam, cefuroxime, ciprofloxacin, imipenem and meropenem and resistant to only ampicillin. In spite of the strains being susceptible to the antibiotics there was high mortality of 87.5% [4,5]. The case reported by Lalas *et al.,* was also sensitive to cephalosporins and aminoglycosides. The patient was given cefotaxime for 14 days and was discharged thereafter in healthy condition [12]. In the report by Aly *et al.*, out of five neonates with septicaemia, two were treated with meropenem, two with piperacillin/ tazobactam and one with cefotaxime and amikacin and all of them survived [11]. In the present case, the baby was initially put on cefotaxime and amikacin empirically for two days, changed to meropenem empirically along with intravenous immunoglobulins and packed platelet concentrate, when the initial blood culture was reported to yield Gram negative bacilli while the final identification and antibiogram was awaited, to which he responded.

Thus, the patient can be summarized to be a case of early onset neonatal sepsis presenting with recurrent generalized clonic seizures and thrombocytopenia within two days of delivery, in a preterm low birth weight infant, caused by *P. agglomerans* and treated with meropenem, phenobarbitone, intravenous immunoglobulin and group matched packed platelet concentrate.

CONCLUSION

Pantoea agglomerans is an infrequent cause of neonatal sepsis. The clinical features may be variable and in the present case the baby presented with seizures and thrombocytopenia. Hence, prompt identification along with antibiotic susceptibility testing is essential for proper management of the cases.

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