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Case Report

First Ever Case of Early Onset Neonatal Sepsis by *Burkholderia cepacia* in SCANU of a General Hospital

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Received: May 14, 2024; **Published:** May 22, 2024

Abstract

Burkholderia cepacia is an aerobic, low virulence, motile, gram-negative bacillus found in soil and water. It is a frequent colonizer of fluids used in the hospital (irrigation solutions, intravenous fluids).

It's not considered as normal human flora. It is a rare cause of sepsis in newborns, and it's transmission involves human contact with heavily contaminated medical devices and disinfectants.

We describe a rare case of sepsis by *B. cepacia* in a term infant, diagnosed in SCANU of Kurmitola General Hospital, Dhaka, Bangladesh. This was the first case of *Burkholderia cepacia* in this SCANU.

This term, male newborn, was admitted with the diagnosis of perinatal asphyxia HIE stage 1 with early onset neonatal sepsis. The diagnosis was made by blood culture. We treated the patient with ceftazidime and amikacin to which the patient responded well and discharged with advice.

Keywords: *Burkholderia cepacia (B. cepacia); Neonatal Sepsis; SCANU; B. cepacia Complex (BCC)*

Introduction

B. cepacia complex (BCC) is an aerobic gram-negative bacillus found in various aquatic environments. It is named after the American microbiologist, William Burkholder, who described the organism in 1950 as the cause of onion rot [1]. *B. cepacia* was first known as *Pseudomonas cepacia*, but in 1992 taxonomists renamed the bacteria as it's different from *Pseudomonas* [2]. *B. cepacia* is able to adapt and survive in hostile environments, including those which have been disinfected. *B. cepacia* is a colonizing organism rather than an infecting organism. This opportunistic human pathogens most often cause infection in immunocompromised individuals. It's transmitted via exposure to contaminated medicines, devices and person-to-person contact and exposure to *B. cepacia* in the environment. *B. cepacia* was first described in patients with cystic fibrosis in the late 1970s. The only way to diagnose *B. cepacia* is to culture the sputum and blood. A culture on selective agars confirms the presence of the bacteria and it's strains. *B. cepacia* can be resistant to many common antibiotics. Treatment should be made on a case-by-case basis [1].

We describe a case of early onset neonatal sepsis caused by *B. cepacia* in Special Care Newborn Unit (SCANU) of Kurmitola General Hospital, Dhaka, Bangladesh. To identify the source of infection, we studied the clinical profile and outcomes of neonates with *Burkholderia* septicemia and determine the antimicrobial susceptibility patterns of the isolates.

Case Presentation

Our patient was term male newborn weighing 3100g. He was born to a 23-year-old lady, who was on irregular antenatal check-up. Mother developed prolonged rupture of membrane for more than 24 hrs. Amniotic fluid was foul smelling and USG of pregnancy profile showed oligohydramnios. Baby was delivered at 37 weeks by LUCS due to prolong labour and PROM. Baby didn't cry after birth and resuscitation was done by bag and mask ventilation for 1 minute. After that respiration was established and baby was admitted in SCANU. Baby was kept NPO; respiratory support was given by nasal cannula at the rate of 2 l/min and treated by antibiotic ceftazidime and amikacin.

Laboratory evaluations showed a white blood cell count of 20,000/cmm, neutrophil count 1710/cmm, platelet count 1,36,000/cmm and CRP < 6 mg/L. Chest radiograph was normal.

The diagnosis of *Burkholderia cepacia* was made by blood culture. The blood culture was done in the Microbiology Department of Armed Forces Institute of pathology. It is a third level laboratory with trained personnel to avoid the errors in isolating the microorganisms associated with the environment. *Burkholderia cepacia* is difficult to isolate due to its slow growth. They used differential culture media, automated systems for isolating the organisms.

The newborn had respiratory distress and lethargy for the first 72 hrs, there after reflex activity improved and gradually respiratory distress resolved. Feeding was started by OG tube and breastfeeding was established by day 7. Oxygen was weaned gradually on day 5. We were able to discharge the patient after 14 days of age with good neurological examination.

This sporadic infection due to *Burkholderia cepacia* in our SCANU was controlled by the timely information given to the clinician, implementation of infection control measures such as hand washing, screening of the staff in SCANU, disinfecting thermometers, sterilisation of instruments and isolation of infected newborn.

Discussion

Burkholderia cepacia is a rare cause sepsis in neonates who are immunocompromised or exposed via nosocomial transmission. It most commonly presents with respiratory tract and urinary tract infection, septic arthritis, peritonitis and blood stream infections [3]. Among few case reports with *Burkholderia cepacia* sepsis in neonates, the prenatal course is typically significant for certain hospital exposures or family history of an immunodeficiency. There are risk factors like prematurity, surgeries, or instrumentation [4]. Contributing maternal risk factors such as poor intrapartum or postnatal infection control practices are also noted [5]. Our patient had risk factor of maternal PROM of more than 24 hrs. Most newborns with *Burkholderia cepacia* sepsis present with respiratory distress, lethargy and vomiting [6].

Patra., *et al*. described a cohort of 12 neonates in India with a gestational age ranged from 29 to 41 weeks who presented with lethargy, tachypnea, or poor feeding. *Burkholderia cepacia* was isolated from blood cultures and neonates were treated with piperacillin-tazobactam, ciprofloxacin and cotrimoxazole either singly or in combination to result in an eventual sterile repeat culture [6].

Chandrasekaran., *et al*. identified a group of 59 average full-term neonates in India where most (59%) had *Burkholderia cepacia* early-onset neonatal sepsis with predominantly respiratory, hemodynamic instability, and abdominal distension. Over 95% either had a previous peripheral IV line used or IV antibiotics administered, and only 29% had maternal risk factors. Piperacillin-tazobactam was the empirical first-line antibiotic [7]. Our patient also presented as early onset neonatal sepsis with lethargy and respiratory distress. Baby was treated and responded well with ceftazidime and amikacin which was sensitive to *Burkholderia cepacia*.

Microbial diagnosis for *Burkholderia cepacia* sepsis is usually done by blood culture using *Burkholderia cepacia* selective agar, *Pseudomonas cepacia* agar, or oxidation-fermentation polymyxin bacitracin lactose agar. *Burkholderia cepacia* selective agar is superior to others as it enhances the growth of *Burkholderia cepacia* while suppressing the growth of other organisms [8]. *Burkholderia cepacia* is difficult to culture, can initially be negative, can prove challenging to properly identify [9-11]. In our patient *Burkholderia cepacia* was isolated in the initial blood culture.

Conclusion

Burkholderia cepacia is a rare cause of septicaemia in newborn This case report highlights the role of *Burkholderia cepacia* causing early onset neonatal sepsis. Clinicians should remain vigilant about the possible sources of infection specifically in the delivery room, it's surveillance, infection control and management. Outcome was good in our case with proper antibiotics according to culture and sensitivity report.

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Volume 13 Issue 6 June 2024