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Case Study

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A CASE REPORT OF NEONATAL MELIOIDOSIS FROM A TERTIARY CARE HOSPITAL, BANGLADESH.

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BACKGROUND

Gram-negative environmental bacterium Burkholderia pseudomallei is the aetiological agent of melioidosis. About 89,000 deaths per year worldwide occurs due to this life-threatening infection. Manifestations of melioidosis can range from acute septicaemia to chronic infection. Due to its facultative intracellular survival and virulence factors, *B. pseudomallei* can manipulate the host's immune responses and signalling pathway to escape immune surveillance. Difficulties in clinical recognition and laboratory diagnosis of melioidosis causes delay in proper antimicrobial therapy. Which often lead to poor outcomes and mortality. For early confirmation of the diseases, better diagnostic tests are needed, which would enable better therapeutic efficacy and survival.

KEYWORDS: Burkholderia pseudomallei, neonatal melioidosis, sepsis, apgar score.

INRODUCTION

Melioidosis, first recognized in 1911[1] is an infectious disease of human and animals caused by Burkholderia pseudomallei It is an environmental Gram-negative bacterium commonly found in the rhizosphere and surface groundwater of many tropical and subtropical regions.[2,3] In Southeast Asia and Australia, it is an infectious disease of major public health importance.[4] About Eighty five percent of melioidosis can be imputable to recent bacterial exposure.[5] An acute melioidosis can be present with sepsis with or without pneumonia, or localized abscesses. Sometimes, this disease has been nicknamed 'the great mimicker' as the presence of nonspecific signs and symptoms can often hinder the diagnosis and management.[6] In Bangladesh, melioidosis is largely underrecognized due to diversified sign and symptoms, low index of suspicion by clinician and lack of confirmatory diagnostic facilities. This infectious disease is very uncommon cause of Gram-negative septicemia in neonates. There are limited data of paediatric Melioidosis in Bangladesh. We report a case of neonatal melioidosis at our microbiology laboratory in a tertiary care hospital of Bangladesh with its clinical presentation, microbiological diagnosis, possible mode of transmission and outcome. Paediatric melioidosis has a high mortality rate which can be reduced with greater awareness, accurate timely diagnosis and prompt appropriate treatment.[7]

CASE REPORT

A pre-term male baby was born by LUCS from 35 years old immunized mother, developed respiratory distress soon after birth. Pre-natal history was uneventful up to 26 weeks of pregnancy and mother had no history of infections, medications or trauma during pregnancy or any other chronic illness. There was a history of spontaneous leaking membrane for 6 days and patient got admitted to Bangabandhu Sheikh Mujib Medical University. She developed premature rupture of the membrane for 2 days. USG showed oligohydramnios and severe fetal distress for 1 day then emergency LUCS done.

The neonate's Apgar scores were 6 and 8 at 1 and 5 min, respectively, and he weighed 1.1 kg at birth. On examination, the child was febrile (38.6oC), had grunting and was lethargic. He had a respiratory rate of 68/min, heart rate 162 beat/min with a low pulse volume and oxygen saturation was 93.95%. The low birth weight preterm baby (27^{+2}wks) was provisionally diagnosed to have Acute Respiratory Distress syndrome with early onset neonatal sepsis and was shifted to the Neonatal Intensive Care Unit (NICU) for respiratory support, pre-term care and monitoring.

Laboratory investigations revealed leukocytosis (total leukocyte count $18000X10^9$/l) with thrombocytosis (platelet count $40X10^9$/l), peripheral Blood film showed toxic granules, high hsCRP (51.91 mg), normal blood

glucose, electrolytes and liver and renal function tests. The neonatal erythrocyte sedimentation rate was normal.

The neonate was put on ventilator soon after admission in the NICU. He was given intravenous fluids. Initially Injection Ampicillin and Gentamicin was started for 5 days then antibiotics were empirically changed to Injection Meropenem and Colistin as the baby's condition was deteriorating. Baby was also given Packet red blood cell 20 ml.

Blood culture in brain heart infusion medium revealed motile, Gram negative bacilli with bipolar staining [Figure A]. Sub-culture on blood agar showed greyish white, smooth colonies with a slight metallic sheen and a distinctive musty odour [Figure B]. MacConkey revealed non-lactose-fermenting colonies, which turned pink after 48 h [Figure C]. The isolate was identified as *B. pseudomallei* based on bipolar appearance, and characteristic biochemical reactions, including positive oxidase reaction, nitrate reduction, and oxidation of glucose and lactose

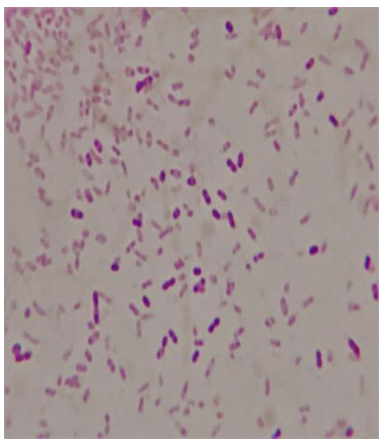

Figure-A

Figure-B

Figure-C

Figure: (A) Gram stain showing bipolar appearance of Burkholderiapseudomallei. (B) Blood agar showing smooth greyish white colonies.(C) MacConkey agar showing smooth-centred pink colonies.

Antibiotic susceptibility testing was performed by the disk diffusion test according to the Clinical Laboratory Standards Institute guidelines.[8] The isolate was susceptible to ceftazidime, tazobactam- piperacillin, ciprofloxacin, cotrimoxazole and meropenem, but resistant to gentamicin, amikacin, and Colistin. The unusual antibiotic susceptibility pattern was also suggestive of *B. pseudomallei* which later on identified by the automated machine VITEK® 2 as *B.pseudomallei*. It was susceptible to Meropenem, tazobactam- piperacillin, ciprofloxacin, cotrimoxazole & Ceftazidime. Despite maximum ICU support and antibiotics treatment, after one month of treatment unfortunately the baby developed DIC with Pneumonia and death occurred due to Acute Cardio Respiratory Failure.

Investigations were conducted to determine the source of infection. *B. pseudomallei* was not recovered from the vaginal swab of the mother or environmental samples (including disinfectant solution, humidifier fluid, ventilator circuit, bed, aircondition vents, wash basin, etc.) from the NICU.

DISCUSSION

B. pseudomallei, a gram-negative bacillus is the causative agent of Melioidosis, usually found in soil and stagnant water.[9] Melioidosis may cause serious infection which sometimes turns in to fatal condition.

Whitmore and his assistant CS Krishnaswami first reported melioidosis cases in 1911.[1] among the morphine addicts of Myanmar. Thereafter some cases of adult melioidosis have been reported from India but only a few cases among children were reported.[10,11,12] Neonatal cases have been reported from the United States of America, Thailand, Malaysia and United Kingdom.[6,13-17] A confirmed case of melioidosis that was first reported from Bangladesh from a British sailor.[18] Fifty-one cases of culture-positive melioidosis were identified between 1964 and 2017, from Bangladesh. Among them, the oldest patient was 90 years old and the youngest was 8 years old.[19] But, to the best of our knowledge, until now, there is no report of neonatal melioidosis from Bangladesh.

Melioidosis is usually transmitted by inhalation or direct contact of skin lesions with contaminated water or soil.[7] Vertical transmission, Perinatal transmission and transmission through breast milk have also been demonstrated.[15,16,20]

In our case, *B. pseudomallei* was not recovered from the environmental samples. Hence, transmission from the environment appears unlikely. The neonate might still have acquired the infection from an unidentified environmental source either by inhalation or by direct contact of minor skin lesions with the infective source.

In the previous documented case of mother-to-child transmission of neonatal melioidosis, *B. pseudomallei* was transmitted from an asymptomatic mother (afebrile and blood culture negative) to the neonate, but *B. pseudomallei* was later recovered from the post-partum cervical specimen of the mother.[21] In our case, *B. pseudomallei* was not isolated from the vaginal specimen of the mother but the presence of asymptomatic bacteremia due to *B. pseudomallei* was not excluded as blood culture of the mother was not performed.Because the presence of *B. pseudomallei* in the mother's blood was not excluded in our case, there is still a rare possibility of transplacental transmission from a subclinical infection in the mother.

The empirical regimen for sepsis such as ceftriaxone and gentamicin do not respond in children with melioidosis Therapy with ceftazidime (40 mg/kg/dose) or IV meropenem (25 mg/kg/dose) eight hourly should be administered in children with severe infections for at least 2 weeks. Then maintenance therapy with co‑trimoxazole (trimethoprim 8 mg/kg/day) and doxycycline (4 mg/kg/day) orally in two divided doses are recommended. Amoxicillin‑clavulanate (15 mg amoxy‑cillin/kg/dose) for three divided doses is advised instead of doxycycline in children below 8 years and pregnant women. Treatment with an oral antibiotic such as amoxicillin‑clavulanate should be continued for a couple of weeks as relapse is common with melioidosis and the child should be followed‑up to ensure remission.[22]

CONCLUSION

In pediatric cases, melioidosis might be underdiagnosed by physician. Our report of neonatal melioidosis wide awake the microbiologists and paediatricians to the possibility of this infection even among neonates. This may point up the need to distinguish non-fermentative Gram-negative bacteria which could be ignored as contaminants, especially when recovered from sterile sites. *B. pseudomallei* and its potential to cause infection in neonates will aid in increased recognition of neonatal melioidosis by better understanding of the morphological appearance, cultural characteristics and biochemical reactions which may remain the golden key to guide appropriate treatment.

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