Profile of Neonatal Sepsis due to *Burkholderia capacia* Complex

We report the result of retrospective record review of the clinical profile of 59 neonates who presented to a tertiary-care extramural neonatal unit with *Burkholderia cepacia* complex infection. Among the 3265 admissions over 45 months, incidence of Burkholderia sepsis was 18 per 1000 admissions. Case fatality rate was 17%. Most (95%) isolates were sensitive to cotrimoxazole.

Keywords: *Etiology, Infection control, Neonate, Septicemia*.

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Infections account for 18% of neonatal deaths globally and 21% of neonatal deaths in India [1]. An increasing proportion of neonatal sepsis is being attributed to non-fermenting gram-negative bacilli (NFGNB), particularly *Burkholderia cepacia* complex (BCC) [2,3]. Prevention and treatment of BCC is challenging due to the organism's inherent ability to survive in moist environments and intrinsic antimicrobial resistance [4,5]. We describe the clinical profile, antimicrobial susceptibility pattern and in-hospital mortality of neonates with BCC infection.

After approval from the Institute's Ethics Committee, we screened blood culture records of outborn neonates admitted to our hospital between October 2011 and June 2015. We retrieved case records of neonates with one or more episodes of BCC sepsis, defined as isolation of *Burkholderia cepaciae* from blood or sterile body fluids along with clinical signs of sepsis. Positive cultures from neonates whose clinical course was not consistent with sepsis and not treated as culture-positive sepsis by the treating team, were considered as contaminants and excluded from the study. Cultures were performed using BacT/Alert continuous microbial detection system. Positive signals were followed by identification of species using Vitek-2 (Biomerieux, France). Antimicrobial susceptibility pattern was tested as per Clinical and Laboratory Standards Institute (CLSI) guidelines [6]. Intravenous piperacillin-tazobactam and amikacin were used as empirical first line antibiotic in both early- and late-onset sepsis.

Among the 3265 admissions, 65 neonates had positive cultures with BCC. After excluding six contaminants, 59 neonates had BCC sepsis (18 per 1000 admissions). Most neonates (59%) had early-onset sepsis. The most common

TABLE I CLINICAL PROFILE AND LABORATORY ABNORMALITIES IN NEONATES WITH SEPSIS DUE TO *BURKHOLDERIA CEPACIA* (*N*=59)

Variable	
*Gestational Age (wk)	37.0 (2.9)
*Birthweight (g)	2702 (770)
Male gender	44 (75%)
Normal/ assisted vaginal delivery	13 (22%)
Maternal risk factors	17 (29%)
Isolation before 72 h of postnatal age	39 (59%)
#Age at isolation (d)	3.0 (1.5-4.0)
Organism isolated within 48 h of admission	56 (95%)
Associated factors at the referring hospital	
Peripheral intravenous line use	57 (97%)
Received IV antibiotics prior to admission	56 (95%)
Central-line use	2 (3%)
Clinical presentation	
$Abdominal distension	29 (49%)
Vomiting/ Increased (>25%) pre-feed gastric aspirate	31 (53%)
Respiratory distress	57 (97%)
Apnea requiring PPV	7 (12%)
Hemodynamic instability	49 (83%)
Intensive care provided	
Mechanical ventilation	34 (58%)
Inotrope infusions	49 (83%)
Laboratory Investigations	
#Total leucocyte count,/µL	13500 (9300- 18200)
#Absolute neutrophil count,/µL	7080 (3570-11856)
#Platelet count, $\times 10^3$/µL	200 (100- 330)
#C-reactive protein, mg/L	57.0 (21.3- 84.7)
Elevated C-reactive protein	42 (71%)
Outcome	
Died before discharge	10 (17%)
#Hospital stay (d)	15 (11-2)

IV: intravenous; PPV: positive pressure ventilation.

*Data expressed as number (%) except *mean (standard deviation), #median (interquartile range). $Abdominal distension was defined as increase in abdominal girth by >2cms.*

clinical presentation was respiratory distress (97%), followed by hemodynamic instability (83%). C-reactive protein was elevated (>5 mg/L) in 71% neonates [7]. Highest antimicrobial sensitivity was observed for cotrimoxazole (95%), followed by meropenem (49%), ceftazidime and minocycline (31% each) and levofloxacin (27%). Case fatality rate was 17% **(*Table* I)**.

An earlier study from Chandigarh noted an increase in the proportion of neonatal sepsis due to NFGNB, subsequently identified as BCC from 0% in 1998 to 30% in 2006 [2]. Although 59% neonates in our series had early onset sepsis with BCC, only 29% had maternal risk factors. This supports the claim that majority of early-onset infections in hospital-born neonates in the developing world may be hospital-acquired, rather than of maternal origin [8]. Microbiological reports often identify both *Pseudomonas* species and *Burkholderia cepacia* as NFGNB, but their antimicrobial susceptibility and treatment options are different. BCC is intrinsically resistant to aminoglycosides, polymyxin (Colistin), and often to piperacillin-tazobactam, while these drugs are useful for infection with *Pseudomonas* [9].

The limitations of our study include its retrospective design and potential inaccuracy in differentiating neonates truly infected with BCC from contaminants.

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Parents' Evaluation of Developmental Status (PEDS) in Screening for Developmental Delay in Thai Children Aged 18-30 Months

The PEDS-Thai is a developmental screening tool. We studied its diagnostic performance among 137 Thai children (48.9%) aged 18-30 month. It had a sensitivity of 92.8% and a specificity of 49.2%. The positive and negative likelihood ratios were 1.82 and 0.14 when compared with clinical diagnosis and diagnostic tool, the Mullen Scales of Early Learning.

Keywords: *Developmental delay, Early diagnosis, Mullen scale of early learning*

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A national health survey of Thai children in 2010 found 30.3% of children aged 1-5 years with delayed development [1]. An early detection of delayed development is crucial for early intervention and a better outcome. Parents are the key source for developmental screening information [2]. The Parents' Evaluation of Developmental Status - Thai version has previously been validated by developmental-behavioral pediatricians, but the only study [3] that compared PEDS-Thai to Denver-II showed a sensitivity of 57.1% and a specificity of 97.6%, but no study has compared it to the standard developmental diagnostic test.

From children attending the Well Child Clinic at our center, 137 children aged 18-30 months whose parents were willing to participate were enrolled. Chronically ill