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NEOSEAP Neonatal Sepsis in Southeast Asia and The Pacific
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Abstract # 322

Late-onset neonatal sepsis in South and Southeast Asia: Results from the NEOSEAP Prospective cohort study

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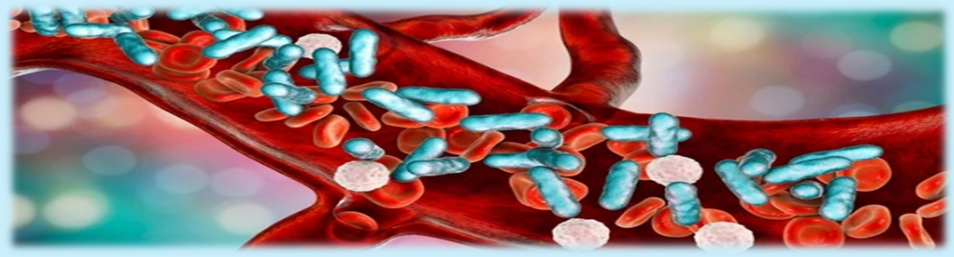


Background

Late-onset neonatal sepsis (LONS) remains a significant cause of neonatal morbidity and mortality, particularly in low- and middle-income countries (LMICs) [1]. The burden is especially pronounced in South and Southeast Asia, where resource limitations, overcrowded neonatal units, and rising antimicrobial resistance pose major challenges to neonatal care [2]. Although LONS is recognized as a critical contributor to adverse outcomes, there is limited evidence regarding its prevalence, the spectrum of causative pathogens, and associated clinical outcomes in this region. A better understanding of the epidemiology of LONS is essential to inform effective prevention strategies, guide empirical treatment, and improve survival among vulnerable neonates.

Objective

To describe the epidemiology, causative pathogens, antimicrobial resistance patterns, and clinical outcomes of late-onset neonatal sepsis (LONS) among infants enrolled in the NeoSEAP-PS study in South and Southeast Asia.

Methods

The study was conducted between 2024 and 2025 at three NeoSEAP sites, including one site in Pakistan and two sites in Indonesia. Infants aged ≤180 days with culture-confirmed sepsis were included. Cases of late-onset neonatal sepsis (LONS) were identified, and descriptive analysis were applied to determine the distribution of causative pathogens, antimicrobial resistance profiles, and clinical outcomes.

Results

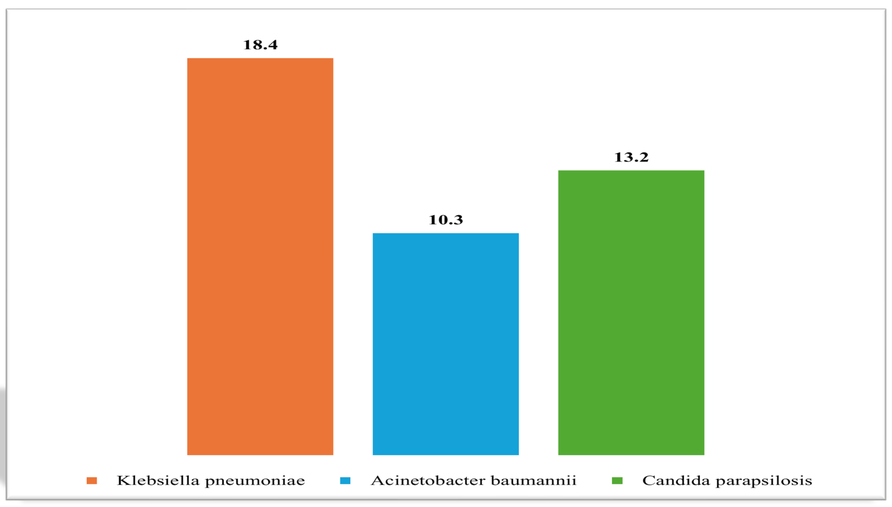
Table1: Prevalence of Late-Onset Sepsis with 95% Confidence Intervals

Type of Sepsis Onset	N	n	Prevalence (%)	95% CI (Lower–Upper)
Late-Onset Sepsis	115	110	95.7	(90.1,98.5)
Early-Onset Sepsis	115	5	4.3	(1.4,9.8)

Note: CI - confidence interval

115 infants with culture-positive sepsis were included in the study, with LONS occurring in 110 (96%) of these infants. The median postnatal age at onset of LONS was 12 days. Most infants with LONS were born prematurely (75%, 82/110; median gestational age at delivery 34 weeks) and were low birth weight (79/110, 72%). The most common pathogens identified as causative of LONS were *Klebsiella pneumoniae* (n=25), *Candida parapsilosis* (n=18), and *Acinetobacter baumannii* (n=14). Antimicrobial resistance was common, with almost two-thirds of tested gram-negative isolates resistant to meropenem (38/61, 62 %). Almost half of infants with LONS died (44/110, 40%).

Percentage of Isolated Microorganisms (%)



Gram-negative isolates resistant to Meropenem

38/61 (62%)

Table 2: Comparison of Maternal and Neonatal Characteristics Between Early-Onset and Late-Onset Sepsis Cases with Associated Relative Risks

Characteristics	Outcome	
	LOS	EOS
	N=110	N=5
	n (%)	n (%)
Sex		
Male	58 (52.7)	3 (60.0)
Female	52 (47.3)	2 (40.0)
Postnatal age (days)		
Mean ± SD	14.87 ± 11.72	0.80 ± 0.84
Median (IQR)	12.00 (7.00-19.00)	1.00 (0.00-1.00)
Gestational age (weeks)		
Mean ± SD	33.63 ± 3.82	34.00 ± 5.24
Median (IQR)	34.00 (31.00-37.00)	34.00 (33.00-37.00)
Gestational age categories		
<37 weeks	82 (74.5)	3 (60.0)
≥37 weeks	28 (25.5)	2 (40.0)
Birth weight category		
Low birth weight (<2,500 g)	79 (71.8)	3 (60.0)
Normal birth weight (≥2,500 g)	31 (28.2)	2 (40.0)
Mode of delivery		
Elective C/S	20 (18.2)	1 (20.0)
Emergency C/S	48 (43.6)	1 (20.0)
Uncomplicated Vaginal Delivery	40 (36.4)	3 (60.0)
Missing	2 (1.8)	0 (0.0)
Place of birth or transfer status of infant		
Inborn	78 (70.9)	2 (40.0)
Referred – Hospital	23 (20.9)	1 (20.0)
Referred – Community	9 (8.2)	2 (40.0)
Suspected Infection Origin		
Community acquired	15 (13.6)	2 (40.0)
Hospital acquired	76 (69.1)	2 (40.0)
Don't Know	2 (1.8)	0 (0.0)
Missing	17 (15.5)	1 (20.0)
Pre-Culture Antibiotic Administration (≤48 hrs)		
Yes	101 (91.8)	3 (60.0)
No	7 (6.4)	2 (40.0)
Don't know	2 (1.8)	0 (0.0)
Maternal Antimicrobials Prior to Labor Onset (≤7 Days)		
Yes	10 (9.1)	0 (0.0)
No	50 (45.5)	4 (80.0)
Don't know	50 (45.5)	1 (20.0)
CRP level categories	90 (81.8)	5 (100.0)
≤10 mg/L	56 (62.2)	3 (60.0)
>10 mg/L	34 (37.8)	2 (40.0)

Note: EOS - Early-Onset Sepsis , LOS - Late-Onset Sepsis

Conclusion

LONS is responsible for a significant mortality burden in neonates in Asia. Gram-negative bacteria and *Candida* spp. predominate as causative, which are difficult to treat in the context of growing AMR. Strengthening infection control and optimizing antibiotic prescribing to reduce this burden is vital, particularly in resource-limited settings

Acknowledgements

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References

1. Popescu CR, Cavanagh MM, Tembo B, Chiume M, Lufesi N, Goldfarb DM, Kissoon N, Lavoie PM. Neonatal sepsis in low-income countries: epidemiology, diagnosis and prevention. *Expert Rev Anti Infect Ther*. 2020;18(5):443-52.
2. Gandra S, Alvarez-Uria G, Turner P, Joshi J, Limmathurotsakul D, van Doorn HR. Antimicrobial resistance surveillance in low- and middle-income countries: progress and challenges in eight South Asian and Southeast Asian countries. *Clin Microbiol Rev*. 2020;33(3):e00048-19.