International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Aerobic Bacteriological Profile of Neonatal Sepsis

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ABSTRACT

The neonatal period which means the first 28 days starting from the birth of a child is a critical, transitional phase that marks the most rapid physiological changes in human life as the infant adapts to life outside the womb. It is a time of high risk for health complications . [1] Neonatal sepsis is a serious bacterial infection and is a major cause of neonatal morbidity and mortality worldwide**.** Early identification of causative organisms helps in appropriate antibiotic therapy**.** Bacteria responsible for neonatal sepsis vary by geographic region and hospital setting**.**

OBJECTIVES: General objective is to determine the aerobic bacteriological profile of neonatal sepsis in new borns admitted to the hospital.

Specific objectives are :

1. Reducing neonatal morbidity and mortality by selecting the appropriate antibiotic therapy.
2. Preventing the development of antibiotic resistance.
3. Helping the clinicians understand the common causative organisms and improve treatment strategies.

PLACE AND DURATION - This is a retrospective observational analysis and the study was conducted in Srinivas Institute of Medical Sciences and Research Centre, Mukka, Suratkal, Mangalore, in the Department of Microbiology from May 2024 to December 2025.

KEYWORDS: Neonatal sepsis, bacterial profile, Staphylococci, Klebsiella pneumoniae , E.coli, Pseudomonas aeruginosa , C.albicans

MATERIALS AND METHODS

Neonatal blood samples from suspected septicemia were analysed by conventional culture methods during May 2024 to December 2025 from newborns admitted in the Paediatrics department of Srinivas Medical College Hospital. Total of 1210 samples were screened of which 230 were found to be positive for growth. Septicemia was suspected in the following settings:

At birth - neonates born to mothers with suspected fever, meconium stained liquor, prolonged labour or fetal asphyxia.

After birth - neonates with lethargy, refusal of feeds, abdominal distension, respiratory distress, pathological jaundice, convulsions etc.

Following procedures - all new borns undergoing an exchange transfusion.

Blood samples were collected in Brain heart infusion broth from a peripheral vein with aseptic precautions before starting any antibiotic therapy and incubated at 37**°C**. Subcultures were made on blood agar and McConkey agar after 24 and 48 hrs. Growth if was seen was identified by standard bacteriological proc-

edures [2] including Gram staining, colony types, biochemical reactions like oxidase test and slide agglutination where was needed.

RESULTS

Of the total of 1210 samples 230 were found to be positive for growth. [19%] . Of the 230 culture positive samples 120 samples were positive for Staphylococci [52.2 %], 76 samples showed the growth of Klebsiella pneumoniae.[33%],

26 were positive for Escherichia coli [11.3 %] , 6 were positive for Pseudomonas aeruginosa [2.6%] and two showed the growth of Candida albicans. [0.8%].

Of the 120 samples of Staphylococcal growth 78 samples were positive for Staphylococcus aureus [33.9%] and 42 sample showed the growth of Coagulase negative Staphylococci (CONS - 18.3%]. All the cultures were grown in pure cultures.

Our results go in parallel with the study conducted in a tertiary care Hospital, Rajakot, where staphylococcal growth was about 50% followed by Klebsiella pneumoniae. (3)

1. Blood Culture Positivity

Total Samples	Culture Positive	Culture Negative	Positivity Rate
1210	230	980	19%

2. Distribution of Organisms in Culture Positive Samples (n = 230)

Organism	Number of Isolates	Percentage
Staphylococci	120	52.2%
Klebsiella pneumoniae	76	33.0%
Escherichia coli	26	11.3%
Pseudomonas aeruginosa	06	2.6%
Candida albicans	02	0.8%
Total	**230**	**100%**

3. Distribution of Staphylococcal Species (n = 120)

Staphylococcal Species	Number	Percentage
Staphylococcus aureus	78	33.9%
Coagulase-negative Staphylococci (CONS)	42	18.3%
Total	**120**	**52.2%**

(Percentages match the total 230 positive samples)

Chi square test was calculated as per SPSS guide lines.

Distribution of organisms: A chi-square goodness-of-fit test showed that the distribution of organisms isolated from neonatal blood cultures differed significantly from equal distribution, $\chi^2(4, N = 230) = 224.17, p < .001$.

Staphylococcal species comparison: A chi-square test showed that **Staphylococcus aureus** isolates were significantly higher than **coagulase-negative Staphylococci (CONS)**, $\chi^2(1, N = 120) = 10.80, p = .001$.

CONCLUSION

Our findings revealed that the most commonly isolated bacteria were Staphylococcal species with more incidence of S.aureus followed by CONS. [4]

The second predominant bacteria was Klebsiella pneumoniae followed by Escherichia coli.

Pseudomonas aeruginosa were isolated from 06 samples [2.6%] which goes in parallel with the study conducted by A.K. Gupta and team . [4]

Candida albicans were isolated from two samples contributing to 0.8% of Candidaemia in our study.

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