

# Bacteriological profile and antibiotic susceptibility pattern of neonatal sepsis at tertiary care hospital in Sangli district of Maharashtra, INDIA: a descriptive study

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## Abstract

Neonatal sepsis remains a significant cause of morbidity and mortality in newborns, more so in developing countries like India due to delivery and post natal care taking place in an unclean environment having more chances of contamination with infective organisms. For the effective treatment of sepsis it is essential to have periodic review regarding the causative organisms and its susceptibility to available antibiotics. Present study was undertaken to describe the bacteriological profile and antibiotic susceptibility pattern of culture isolates from Neonatal sepsis patients at a tertiary care centre in Sangli district of Maharashtra, India. Study was carried over a period of one year at the Department of Paediatrics of PVPGH Sangli and Govt Medical College, Miraj. One hundred and five neonates (0 to 28 days) with clinical diagnosis of sepsis were included in the study. Patients who underwent surgery and those who were older than 28 days were excluded. Blood culture reports were studied in 105 cases of clinically suspected septicaemia in neonates using the standard technique of Mackie and McCartney. The antibiotic sensitivity was performed by Kirby-Bauer's disc diffusion method. Blood culture was positive in 19 cases (18.09%). *Klebsiella pneumoniae* and *staphylococcus aureus* were the most common isolated organisms. Resistance to antibiotics was very common in isolated organisms. Gram positive organisms isolated were found to be sensitive to ciprofloxacin, amikacin, chloramphenicol and gram negative organisms were found to be sensitive to vancomycin.

**Key Word:** neonatal sepsis, Sangli.

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40% of neonatal death is attributable to sepsis<sup>1</sup>. An early treatment and the appropriate and the rational use of antibiotics would minimize the risk of severe morbidity and mortality in neonatal sepsis. For the success of an early empiric treatment, a periodic review of the cases to assess any changing trends in the infecting organisms and their antimicrobial susceptibility is important<sup>2</sup>. Present study was undertaken to describe the bacteriological profile and antibiotic susceptibility pattern of culture isolates from Neonatal sepsis patients at a tertiary care centre in Sangli district of Maharashtra, India.

## INTRODUCTION

Septicaemia is a major cause of morbidity as well as mortality during the neonatal period. According to the data from the World Health Organization (WHO), 85% of newborn deaths are caused due to infections including sepsis, pneumonia, and tetanus. In developing countries,

## METHODS

Study was carried over a period of one year at the Department of Paediatrics of PVPGH Sangli and Govt Medical College, Miraj. One hundred and five neonates (0 to 28 days) with clinical diagnosis of sepsis were included in the study. Patients who underwent surgery

and those who were older than 28 days were excluded. Informed and written consent of parents of babies was taken before enrolment of baby for the study. Approval was taken from Ethics Committee of Govt Medical College, Miraj prior to commencement of the study. For blood culture, the skin of venipuncture site was cleaned thoroughly with dilute iodine solution followed by methylated spirit and blood was drawn by a 2 ml syringe and 20 gauge needles. Blood culture reports were studied in 105 cases of clinically suspected septicaemia in neonates using the standard technique of Mackie and McCartney. The antibiotic sensitivity was performed by Kirby-Bauer's disc diffusion method<sup>3</sup>. Antibiotics tested were Ampicillin, Cefuroxime, Ciprofloxacin, Amikacin, Chloramphenicol, Vancomycin.

### RESULTS

Blood culture was positive in 19 cases (18.09%). Table-1 shows the organisms isolated from the culture positive cases of neonatal sepsis.

**Table 1:** Organisms isolated from culture positive cases of Neonatal Sepsis

Organism	Number of cases	Percentage
Klebsiella Pneumoniae	6	31.57
Staphylococcus Aureus	4	21.05
E Coli	4	21.05
Pseudomonas aeruginosa	3	15.78
Enterobacter	1	5.26
Citrobacter	1	5.26
<b>Total</b>	<b>19</b>	<b>100</b>

In the present study, most isolates were multi drug resistant. Gram negative bacteria were resistant to ampicillin and cefuroxime. Out of 6 Klebsiella isolates, 4 were sensitive to ciprofloxacin, three were sensitive to amikacin and two were sensitive to chloramphenicol. Enterobacter was sensitive only to amikacin and Citrobacter to amikacin and chloramphenicol. Out of three pseudomonas isolates, one was sensitive to ciprofloxacin and remaining two were not sensitive to any of the antibiotics tested. Out of 4 isolates of Escherichia Coli, two were sensitive to amikacin and ciprofloxacin, one to amikacin and one was not sensitive to any of the antibiotics tested. Two isolates of staphylococcus aureus were sensitive to vancomycin and two were not sensitive to any of the antibiotics tested.

### DISCUSSION

The present study aimed at finding the prevalence of bacterial pathogens associated with neonatal septicaemia and their sensitivity to conventional antibiotics. The

results showed 18.09% positive blood culture causing sepsis among the neonates. This finding is similar to the 19.2% culture positive cases reported by Agnihotri et al<sup>4</sup>. P Jyothi et al<sup>5</sup> also reported similar prevalence of culture positive cases. The pathogens most often implicated in neonatal sepsis in developing countries differ from those seen in developed countries. Overall, Gram-negative organisms are more common and are mainly represented by Klebsiella, Escherichia coli, Pseudomonas, and Salmonella. Of the Gram-positive organisms, Staphylococcus aureus, CONS, Streptococcus pneumonia, and S. pyogenes are most commonly isolated<sup>6</sup>. In our study, Klebsiella was the commonest organism isolated followed by staphylococcus aureus and E coli. Antibiotic resistance is today a global problem. Reports of multi-resistant bacteria causing neonatal sepsis in developing countries are increasing. The wide availability of over-the-counter antibiotics and the inappropriate use of broad-spectrum antibiotics in the community may explain this situation. It is difficult to compare antibiotic resistance between countries because the epidemiology of neonatal sepsis is extremely variable<sup>6</sup>. Present study showed high prevalence of resistance to commonly used antibiotics. Thus, there is a need to create awareness regarding judicious use of antibiotics. Further research needs to be done on a larger scale to ascertain the patterns of bacteriological profile and antibiotic sensitivity patterns in urban and rural areas across various geographical regions in India which will help in effective management of neonatal sepsis.

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