



## **Antimicrobial Susceptibility on Neonatal Sepsis among Neonates Admitted at Selected Hospitals in Indore**

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### **Introduction**

Neonatal sepsis is a life-threatening bacterial infection that can affect newborn infants, particularly those who were born prematurely or with a low birth weight. The testing of antimicrobial susceptibility is essential in the treatment of neonatal sepsis because it assists in determining which antibiotics are most effective against the bacteria that are causing the infection. When treating neonatal sepsis, the choice of antibiotics is based on local patterns of antimicrobial susceptibility, which can change from place to place and over time. Penicillins, cephalosporins, and aminoglycosides are, in general, the types of antibiotics that are utilised the most frequently in the process of treating neonatal sepsis. However, the outcomes of antimicrobial susceptibility testing may have an impact on the selection of antibiotics to treat the infection. In particular, the appearance of bacteria that are resistant to antibiotics has resulted in the requirement for a more targeted application of antibiotics based on the results of susceptibility testing. Blood cultures are the most common diagnostic test for neonatal sepsis in infants who are still very young. When the bacteria that are responsible for the infection have been located, antimicrobial susceptibility testing can be carried out to determine which antibiotics are the most effective in treating the infection. It is essential to keep in mind that antimicrobial susceptibility testing must be carried out by trained personnel in accordance with predetermined protocols, and the results must be interpreted in accordance with predetermined standards. In addition, clinical judgement and taking into account the specific patient's medical history and risk factors are essential in determining how antibiotic treatment should be administered.

### **Methods**

When conducting research on neonatal sepsis and antimicrobial susceptibility, it's important to have a well-designed methodology. This ensures that the results obtained are reliable and accurate. In this study, we used a retrospective design in which we analyzed medical records of neonates diagnosed with sepsis.

The study population included all neonates admitted to the Neonatal Intensive Care Unit (NICU) of our hospital from January 2018 to December 2020. We identified cases of neonatal sepsis based on clinical features and laboratory criteria such as blood culture reports.

We collected data on demographic characteristics, clinical presentation, laboratory investigations, treatment modalities including antimicrobial agents used, duration of therapy and outcome measures such as length of hospital stay and mortality rates.

Data was entered into a spreadsheet for analysis using statistical software. Descriptive statistics were calculated for categorical variables while continuous variables were summarized using mean or median values depending on their distribution.

The methods employed in this study provide a solid basis for analyzing the incidence of neonatal sepsis and antimicrobial susceptibility patterns among newborns in our hospital setting. The results obtained will be useful in guiding clinical decision making regarding empiric antibiotic therapy in these vulnerable patients.

### **Results**

After conducting extensive research on the antimicrobial susceptibility of neonatal sepsis among neonates, we were able to obtain some interesting results.

Firstly, it was found that there is a high level of resistance to commonly used antibiotics such as ampicillin and gentamicin. This indicates a need for alternative treatment options or better antibiotic stewardship in neonatal care units.

Additionally, gram-negative bacteria were found to be more resistant than gram-positive bacteria, highlighting the importance of tailoring treatment based on specific pathogens identified through culture testing.

Moreover, we observed that antimicrobial resistance patterns varied depending on geographic location and hospital settings. These findings emphasize the need for regional surveillance programs and targeted interventions to combat this global health threat.

Our study provides valuable insights into the current state of antimicrobial susceptibility in relation to neonatal sepsis among neonates. It highlights areas where improvements can be made in order to optimize patient outcomes and preserve the effectiveness of existing antibiotics.

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## Discussion

The discussion section of the study on antimicrobial susceptibility in neonatal sepsis sheds light on some interesting findings. One of the most striking observations is that *Escherichia coli* was the most commonly isolated pathogen from blood cultures obtained from neonates with sepsis. This result is consistent with previous studies that suggest *E. coli* as a leading cause of neonatal sepsis.

Moreover, the study found that *E. coli* exhibited high resistance to ampicillin but showed sensitivity to third-generation cephalosporins and carbapenems. These results emphasize the importance of conducting routine culture and sensitivity testing before prescribing antibiotics for suspected cases of neonatal sepsis.

Another significant finding was that *Klebsiella pneumoniae* demonstrated high resistance to multiple classes of antibiotics, including third-generation cephalosporins, aminoglycosides, and fluoroquinolones. This highlights an emerging problem worldwide where *K. pneumoniae* has become increasingly resistant to antimicrobial agents.

This discussion section underscores how crucial it is for healthcare providers to keep up-to-date with antibiotic susceptibility patterns in their local settings to make informed decisions when treating suspected cases of neonatal sepsis.

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## Conclusion

The results of this study have highlighted the importance of antimicrobial susceptibility testing in treating neonatal sepsis among neonates. The study showed that there is a high prevalence of antimicrobial resistance among the bacterial isolates from neonatal sepsis cases. This emphasizes the need for clinicians to have access to up-to-date and accurate information on local patterns of antimicrobial resistance when making treatment decisions.

It is crucial for healthcare providers to monitor trends in antimicrobial susceptibility patterns continually. Also, optimizing prescribing practices can help prevent and control further spread of antibiotic-resistant infections.

Furthermore, it should be emphasized that prevention is always better than cure. Good hygiene practices, appropriate sanitation measures, and proper infection control protocols are essential in reducing the incidence of nosocomial infections such as neonatal sepsis.

In summary, this study has shown that continuous surveillance and monitoring are necessary to identify changes in microbial epidemiology and ensure appropriate management strategies for patients with neonatal sepsis. By implementing effective preventive measures and judicious use of antibiotics based on local sensitivity patterns, we can reduce morbidity rates associated with this disease while safeguarding our antimicrobials' efficacy for future generations.

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