

Emerging trends in neonatal infections: Antimicrobial resistance and new therapies.

Kathrin Glenn*

Department of Mother and Child, University of Parakou, Benin

Introduction

Neonatal infections remain a significant concern in global healthcare, particularly due to the unique vulnerabilities of newborns [1]. In recent years, emerging trends such as antimicrobial resistance (AMR) and the development of new therapies have become increasingly important in addressing the challenges associated with these infections. Understanding these trends is crucial for improving the prevention, diagnosis, and treatment of neonatal infections, thereby enhancing outcomes for this fragile population [2].

Antimicrobial resistance is one of the most pressing issues in neonatal care today. AMR occurs when bacteria, viruses, fungi, or parasites evolve to resist the effects of medications, making standard treatments less effective and leading to persistent infections that are harder to treat [3]. In the context of neonatal infections, AMR is particularly concerning because newborns are already at a high risk due to their immature immune systems. The emergence of drug-resistant pathogens exacerbates this risk, leading to increased morbidity and mortality among affected infants [4].

One of the key drivers of AMR in neonatal settings is the overuse and misuse of antibiotics. In many cases, antibiotics are administered empirically, meaning they are given based on clinical judgment before the specific pathogen is identified [4]. While this approach is often necessary due to the rapid progression of neonatal infections, it can contribute to the development of resistance if not carefully managed [6]. In neonatal intensive care units (NICUs), where the use of broad-spectrum antibiotics is common, the risk of AMR is particularly high. This has led to the emergence of multidrug-resistant organisms (MDROs) such as methicillin-resistant *Staphylococcus aureus* (MRSA), extended-spectrum beta-lactamase (ESBL)-producing Enterobacteriaceae, and carbapenem-resistant Enterobacteriaceae (CRE) [7].

One emerging trend in addressing AMR is the development of new antimicrobial agents. Research is ongoing to discover and develop antibiotics that are effective against resistant pathogens, particularly those that pose a significant threat in neonatal settings. For example, new beta-lactam/beta-lactamase inhibitor combinations and novel classes of antibiotics are being explored for their potential to treat infections caused by MDROs. Additionally, efforts are being made to repurpose existing drugs and optimize dosing

regimens for neonates to maximize their efficacy while minimizing the risk of resistance [8].

In parallel with the development of new antibiotics, alternative therapies are also being investigated as potential solutions to the AMR crisis. One promising approach is the use of bacteriophages—viruses that infect and kill specific bacteria [9]. Bacteriophage therapy has shown potential in treating antibiotic-resistant infections in preclinical studies and early clinical trials, and it may offer a viable alternative or adjunct to traditional antibiotics in the future. Phage therapy is particularly attractive in neonatal care because it can be tailored to target specific pathogens without disrupting the normal microbiota, reducing the risk of secondary infections [10].

Conclusion

The landscape of neonatal infections is being shaped by the dual challenges of antimicrobial resistance and the need for new therapies. While AMR presents significant risks to neonatal health, ongoing research and innovation are paving the way for more effective prevention and treatment strategies. By embracing these emerging trends, healthcare providers can better protect newborns from the dangers of infection and ensure healthier outcomes for this vulnerable population.

References

1. Tziella C, Borghesi A, Pozzi M, et al. Neonatal infections due to multi-resistant strains: Epidemiology, current treatment, emerging therapeutic approaches and prevention. *Clin Chim Acta*. 2015;451:71-7.
2. Thaver D, Ali SA, Zaidi AK. Antimicrobial resistance among neonatal pathogens in developing countries. *Pediatr Infect Dis J*. 2009;28(1):19-21.
3. Folgari L, Bielicki J. Future challenges in pediatric and neonatal sepsis: emerging pathogens and antimicrobial resistance. *J Pediatr Intensive Care*. 2019;8(01):017-24.
4. Cailes B, Vergnano S, Kortsalioudaki C, et al. The current and future roles of neonatal infection surveillance programmes in combating antimicrobial resistance. *Early Hum Dev*. 2015;91(11):613-8.
5. Romandini A, Pani A, Schenardi PA, et al. Antibiotic resistance in pediatric infections: global emerging threats, predicting the near future. *Antibiotics (Basel)*. 2021;10(4):393.

*Correspondence to: Kathrin Glenn, Department of Mother and Child, University of Parakou, Benin. E-mail: glenn@pu.BN.co

Received: 25-Jul-2024, Manuscript No. AAPNM-24-147336; Editor assigned: 26-Jul-2024, PreQC No. AAPNM-24-147336(PQ); Reviewed: 09-Aug-2024, QC No. AAPNM-24-147336; Revised: 15-Aug-2024, Manuscript No. AAPNM-24-147336(R); Published: 22-Aug-2024, DOI: 10.35841/aapnm-8.4.219

6. Fanaroff AA, Fanaroff JM. Advances in neonatal infections. *Am J Perinatol.* 2020;37(02):5-9.
7. Tzialla C, Borghesi A, Serra G, et al. Antimicrobial therapy in neonatal intensive care unit. *Ital J Pediatr.* 2015;41:1-6.
8. Khaliq A, Rahman SU, Gul S, et al. Emerging antimicrobial resistance causing therapeutic failure in neonatal sepsis. *Int J Infect Dis.* 2019;20:101233.
9. Folgore L, Ellis SJ, Bielicki JA, et al. Tackling antimicrobial resistance in neonatal sepsis. *Lancet Glob Health.* 2017;5(11):1066-8.
10. Roy MP, Bhatt M, Maurya V, et al. Changing trend in bacterial etiology and antibiotic resistance in sepsis of intramural neonates at a tertiary care hospital. *J Postgrad Med.* 2017;63(3):162-8.