

Authors' reply to the letter "Effectiveness of a blood culture bundle in reducing contamination rates in a neonatal intensive care unit"

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Dear Editor,

We are grateful for the insightful comments¹ and interest in our recently published article, "Effectiveness of a blood culture bundle in reducing contamination rates in a neonatal intensive care unit".² We appreciate the recognition of our study's contribution in highlighting the significance of structured interventional bundles in improving diagnostic reliability in the neonatal intensive care unit (NICU).

Sepsis risk determinants such as premature rupture of membranes, low Apgar score, and mechanical ventilation were not included in our analysis. We agree that these factors are crucial in neonatal sepsis development.³ However, the primary objective of our study was not a comprehensive risk analysis of neonatal sepsis. Our specific focus was on improving the reliability of blood culture results through the implementation of a structured interventional bundle. We aimed to demonstrate that standardizing collection practices, rather than analyzing predisposing patient factors, is effective in reducing contamination. Also,

in our NICU, the standard protocol dictates single blood culture sampling. This approach is primarily driven by local resource norms and the critical need to adhere to strict blood volume constraints in neonates, for whom even small sample volumes can be clinically significant. The decision to employ single blood culture sampling in our NICU is informed by the delicate balance between diagnostic need and patient safety, particularly concerning blood volume conservation in extremely low birth weight infants. By effectively reducing the rate of contamination, we indirectly but significantly improved the diagnostic accuracy of our cultures.

Second, a single blood culture limiting diagnostic sensitivity and the need to specify the sampling site are well taken. Our study protocol strictly followed NICU standards, which involved single-site peripheral blood sampling. While multiple-site sampling may enhance diagnostic sensitivity, our main goal was to specifically assess contamination reduction through bundle implementation related to peripheral blood cultures.⁴ We confirm that blood cultures in this study were obtained exclusively from

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peripheral venous sites; no cord or central catheter samples were taken.

Thirdly, we appreciate the concern that interpreting results across pre- and post-intervention groups might be affected by baseline differences. We confirm that pre- and post-intervention cultures were obtained from discrete cohorts. To robustly address potential baseline differences, we compared patient demographics and clinical characteristics between groups and found no significant differences.

Finally, we fully concur that incorporating standardized diagnostic frameworks, advanced laboratory methods, and artificial intelligence models are important future directions for improving early detection of neonatal sepsis. Our study's main objective was to demonstrate that structured bundle interventions successfully improve the reliability of blood culture collection, which remains the current gold standard for sepsis diagnosis. Our findings underscore the importance of standardization and bundle approaches for even seemingly simple routine procedures.⁵ By improving the collection of blood cultures—the gold standard—our work enhances diagnostic reliability, patient safety, and positively impacts treatment costs.

We are grateful for the constructive feedback, which has been helpful in clarifying the specific focus and limitations of our work. We hope our article will continue to stimulate discussions among clinicians and researchers dedicated to improving NICU practices.

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Conflict of interest

The authors declare that there is no conflict of interest.

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