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Platelet Parameters May Serve as Potential Biomarkers for Sepsis in Low- and Middle-Income Countries: A Systematic Review and Meta-Analysis

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 27 April 2025 and was last updated on 27 April 2025.

INTRODUCTION

Review question / Objective The present study specifically explores the clinical utility of three platelet parameters ratios in sepsis management.

Rationale Sepsis is a major global health challenge, disproportionately impacting low- and middle-income countries (LMICs) where limited access to advanced diagnostics hinders timely detection and prognosis. Conventional biomarkers are often costly or unavailable in resource-constrained settings. Platelet indices ratios have emerged as potential low-cost, accessible alternatives for sepsis management.

Condition being studied Sepsis represents a life-threatening clinical syndrome stemming from a dysregulated physiological response to infection, characterized by acute multi-organ dysfunction and substantially elevated mortality risk. Of particular concern is pediatric sepsis, which disproportionately affects low- and middle-income countries (LMICs), imposing catastrophic health burdens while generating profound socioeconomic repercussions across affected regions.

METHODS

Participant or population Patients with sepsis.

Intervention Not applicable.

Comparator Not applicable.

Study designs to be included Cohort study or case-control study.

Eligibility criteria A study involving the role of platelet parameters ratios in sepsis designed as a cohort study or case–control study.

Information sources PubMed, Embase, Web of Science, and Ovid Medline.

Main outcome(s) Diagnostic performance : Sensitivity, specificity, and standardized mean differences (SMD) for sepsis detection.
Prognostic value : Association of platelet ratios with mortality (e.g., baseline ratio differences between survivors and non-survivors).

Quality assessment / Risk of bias analysis The qualities of identified studies were evaluated using the Newcastle-Ottawa Scale (NOS), and the scale to investigate quality was based on three aspects: selection, comparability, and exposure in the primary study. The total score ranged from 0 to 9 (0–3, 4–6, and 7–9 was considered low-, moderate-, and high-quality, respectively).

Strategy of data synthesis SMDs with 95% CIs were calculated to compare platelet parameter ratios between cohorts. Diagnostic performance metrics including pooled sensitivity, specificity, positive likelihood ratio, negative likelihood ratio , and diagnostic odds ratio were computed to evaluate clinicalutility.

Subgroup analysis Neonates and children group; adult group.

Sensitivity analysis Use statistical metrics to identify studies with high leverage or outliers that might skew overall conclusions.

Country(ies) involved China.

Keywords sepsis, platelet parameters , biomarker, mortality, meta-analysis.

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