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Prognostic values of combined ratios of white blood cells in glioma: a systematic review and meta-analysis

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Abstract

Gliomas, the most prevalent type of neurological tumor, pose a challenging prognosis for patients. Recent studies have underscored the importance of inflammatory markers such as the neutrophil/lymphocyte ratio (NLR), platelet/lymphocyte ratio (PLR), and monocyte/lymphocyte ratio (MLR) in predicting the prognosis of gliomas. We undertook a thorough meta-analysis to elucidate the role of these inflammatory markers in forecasting the prognosis of glioma patients. We extracted hazard ratios (HR) and their corresponding 95% confidence intervals (95% CI) from each study for analysis. To assess heterogeneity and identify influential studies, we conducted sensitivity analysis. Subgroup analysis was performed to investigate sources of heterogeneity, and we employed Egger's test to evaluate publication bias in the meta-analysis. Higher NLR levels were associated with shorter overall survival (HR = 1.46, 95% CI: 1.33-1.60) and progression-free survival (HR = 1.24, 95% CI: 1.04-1.48). There was no significant correlation between PLR levels and overall survival (HR = 1.01, 95% CI: 1.00-1.01) or progression-free survival (HR = 1.00, 95% CI: 0.98-1.02) in glioma patients. Elevated MLR levels were associated with decreased overall survival in glioma patients (HR = 1.78, 95% CI: 1.36-2.34). SII levels did not show any significant association with overall or progression-free survival in glioma patients (HR = 1.00, 95% CI: 0.99-1.01). In the sensitivity analysis, two studies potentially contributed to the instability. Subgroup analyses showed patient population and area were identified as potential sources of heterogeneity. Egger's test showed that there was publication bias in the relationship between NLR and PLR and overall survival ($P < 0.05$). All randomized controlled models, except for these, were not affected by publication bias. NLR and MLR are two reliable indicators of inflammation in the prognosis of glioma patients; PLR and SII do not have significant value in the prognosis of glioma patients.

Keywords: Glioma; Inflammatory markers; Prognostic Values.

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