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# Preoperative platelet distribution width-to-platelet count ratio as a prognostic factor in patients with glioblastoma multiforme

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## Abstract

**Backgrounds:** The prognostic significance of the platelet volume indices (PVIs), including the platelet distribution width (PDW), mean platelet volume (MPV), and platelet distribution width-to-platelet count ratio (PDW/P) has been demonstrated in a variety of malignancies. This study aimed to evaluate the prognostic value of PVIs in patients with a newly diagnosed glioblastoma multiforme (GBM).

**Methods:** We retrospectively evaluated the clinical data of 143 patients with GBM who managed at our center between May 2010 and May 2019. Receiver operating characteristic curves (ROC) for cutoff value determination, Kaplan-Meier survival analysis, and univariate and multivariate Cox regression analyses were performed.

**Results:** The corresponding cutoff values for MPV, PDW, and PDW/P were 9.05, 14.7, and 0.51, respectively. The Kaplan-Meier survival analyses showed that patients with an MPV < 9.05 and those with PDW < 14.7 and cases with PDW/p < 0.51 had a longer overall survival (OS) ( $p < 0.05$ ). Based on univariate analysis, age, Karnofsky Performance Status scores (KPS), tumor focality, MPV, PDW, and PDW/P were predictors of OS ( $p < 0.05$ ). Final multivariate Cox regression analyses showed age (HR 1.040, 95% CI 1.009-1.071,  $P, 0.011$ ),

KPS (HR 2.208, 95% CI 1.107-4.405, P,0.025), tumor focality (HR 4.596, 95% CI 1.988-10.626,  $p < 0.001$ ), and PDW/P (HR 1.786, 95% CI 1.103-3.072, P,0.037) as the independent predictors of OS in patients with newly diagnosed glioblastoma.

**Conclusions:** Our results suggest an elevated preoperative PDW/P, along with previously established variables, as a simple and inexpensive prognostic factor for patients with GBM.

**Keywords:** Platelet volume indices; glioblastoma multiforme; mean platelet volume; overall survival; platelet distribution width.