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ORIGINAL ARTICLE

Platelet-to-White Blood Cell Ratio as a Predictor for Thirty-Day Mortality in Patients with Spontaneous Supratentorial Intracerebral Hemorrhage

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SUMMARY

Background: **Spontaneous intracerebral hemorrhage (ICH) presents a substantial public health challenge due to its high mortality rates. Although the platelet-to-white blood cell ratio (PWR) has been identified as an independent prognostic factor in various diseases, its association with ICH outcome remains unclear. This study aimed to investigate the relationship between PWR and the thirty-day mortality rate in patients with spontaneous supratentorial ICH.**

Methods: **A retrospective analysis of 296 adult patients was conducted, collecting data on demographics, Glasgow Coma Score (GCS), underlying conditions, and laboratory results. PWR was calculated as the absolute value of the platelet-to-white blood cell ratio. The primary outcome was the thirty-day mortality during hospitalization. Multivariable logistic regression analysis was performed to identify independent predictors of thirty-day mortality.**

Results: **The study revealed a significant inverse association between PWR and thirty-day mortality (odds ratio: 0.88, 95% CI: 0.79 - 0.98, p = 0.02). A 12% increase in mortality risk was observed for every unit decrease in PWR. Kaplan-Meier survival curves demonstrated a significantly lower survival rate within 30 days for patients with PWR < 15.0 (log-rank test: p < 0.01). Admission GCS and chronic kidney disease were also identified as independent predictors of thirty-day mortality (p = 0.04 and p < 0.01, respectively).**

Conclusions: **PWR is a significant predictor of thirty-day mortality in patients with spontaneous supratentorial ICH. Lower PWR values correspond to a higher mortality risk, highlighting the potential utility of PWR as a prognostic indicator for ICH patients.**

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Supplementary Data

Table S1. Comparative analysis of clinical features for 296 patients categorized by thirty-day mortality.

	Thirty-day mortality			
	n = 296	No	Yes	p
		n = 270	n = 26	
Age (years)	61.6 (SD 13.7)	60.9 (SD 13.6)	68.6 (SD 13.1)	< 0.01
Gender				
Female	102	91	11	0.38
	34.5%	33.7%	42.3%	
Male	194	179	15	
	65.5%	66.3%	57.7%	
Admission GCS				
9 - 15	205	201	4	< 0.01
	69.3%	74.4%	15.4%	
6 - 8	40	38	2	
	13.5%	14.1%	7.7%	
3 - 5	51	31	20	
	17.2%	11.5%	76.9%	
ICH location				
Cerebral lobe	84	77	7	0.15
	28.4%	28.5%	26.9%	
Thalamus	69	65	4	
	23.3%	24.1%	15.4%	
Basal ganglia	137	124	13	
	46.3%	45.9%	50.0%	
Ventricle	6	4	2	
	2.0%	1.5%	7.7%	
Intraventricular extension	114	93	21	< 0.01
	38.5%	34.4%	80.8%	
Hydrocephalus	59	51	8	0.15
	19.9%	18.9%	30.8%	
Intraparenchymal hematoma (mL)	38.9 (SD 50.1)	32.9 (SD 42.8)	100.4 (SD 75.1)	< 0.01
Midline shift (mm)	2.8 (SD 5.4)	2.1 (SD 4.3)	10.3 (SD 8.9)	< 0.01
White blood cell (1,000/μL)	9.8 (SD 4.1)	9.6 (SD 3.9)	12.1 (SD 5.5)	< 0.01
Platelet (1,000/μL)	215.3 (SD 64.3)	217.2 (SD 63.0)	195.8 (SD 75.8)	0.11
Platelet-to-white blood cell ratio	24.6 (SD 10.0)	25.2 (SD 10.0)	17.7 (SD 6.7)	< 0.01

Table S1. Comparative analysis of clinical features for 296 patients categorized by thirty-day mortality (continued).

	Thirty-day mortality			
	n = 296	No	Yes	p
		n = 270	n = 26	
Pre-admission conditions				
Seizure	14	10	4	0.03
	4.7%	3.7%	15.4%	
Hypertension	265	244	21	0.17
	89.5%	90.4%	80.8%	
Diabetes mellitus	75	65	10	0.11
	25.3%	24.1%	38.5%	
Atrial fibrillation	13	13	0	0.61
	4.4%	4.8%	0.0%	
Stroke history	58	54	4	0.57
	19.6%	20.0%	15.4%	
Coronary artery disease	9	7	2	0.18
	3.0%	2.6%	7.7%	
Chronic kidney disease	26	14	12	< 0.01
	8.8%	5.2%	46.2%	
Smoking	87	77	10	0.29
	29.4%	28.5%	38.5%	
Alcoholism	77	73	4	0.20
	26.0%	27.0%	15.4%	
Anticoagulant therapy	9	8	1	0.57
	3.0%	3.0%	3.8%	
Antiplatelet therapy	58	47	11	< 0.01
	19.6%	17.4%	42.3%	
Statin therapy	37	31	6	0.11
	12.5%	11.5%	23.1%	
Surgical procedures				
External ventricular drainage	36	33	3	1.00
	12.2%	12.2%	11.5%	
Craniotomy or Craniectomy	76	73	3	0.08
	25.7%	27.0%	11.5%	
Permanent CSF shunting	25	25	0	0.15
	8.4%	9.3%	0.0%	
Tracheostomy	11	11	0	0.61