Mean platelet volume in severe traumatic brain injury

- Factors associated with the progression of traumatic intracranial hematoma during interventional radiology to establish hemostasis of extracranial hemorrhagic injury in severe multiple trauma patients
- Impact of Antithrombotic Agents on Radiological Lesion Progression in Acute Traumatic Brain Injury: A CENTER-TBI Propensity-Matched Cohort Analysis
- Simulated Aeromedical Evacuation in a Polytrauma Rat Model
- Treatment of combined traumatic brain injury and hemorrhagic shock with fractionated blood products versus fresh whole blood in a rat model

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In cases of severe traumatic brain injury (TBI), there may be an increase in mean platelet volume (MPV). This is thought to be due to the activation of platelets and their increased release from the bone marrow in response to the injury.

Studies have suggested that higher MPV levels in severe TBI may be associated with worse outcomes, including increased mortality and poorer neurological outcomes. This may be due to the role of platelets in inflammation and the formation of blood clots, both of which can contribute to further damage in the brain following injury.

However, it is important to note that MPV levels are just one factor among many that can influence outcomes in severe TBI. Other factors, such as the extent and location of the injury, the presence of other injuries or medical conditions, and the quality of medical care received, can all play a role in determining outcomes.

Therefore, while MPV levels may be a useful diagnostic tool in severe TBI, they should be considered in the context of other clinical and imaging findings, as well as patient history and risk factors.

Palabiyik et al. retrospectively analyzed intensive care unit patients with traumatic brain injury. They recorded patients' ages; genders; diagnoses; Glasgow Coma Scale scores; length of intensive care unit stay (in days); mean platelet volume, platelet distribution width, platelet count-to-total lymphocyte count ratio, and red cell distribution width values upon hospital admission; and health on the 7th and 30th days of their stays.

They analyzed data from 110 patients. Of these, 84 (76.4%) were male and 26 (23.6%) were female. On the 7- and 30-day mortality evaluations, compared to the living patients, the deceased patients had a significantly higher median age and a significantly lower median Glasgow Coma Scale. Thus, increased age and lower Glasgow Coma Scale scores were associated with increased 7- and 30-day mortality rates. mean platelet volume and platelet distribution width values were similar in living and deceased patients. platelet count-to-total lymphocyte count ratio values were lower in deceased patients, but this difference was not statistically significant. Within 30 days after traumatic brain injury, deceased patients' red cell distribution width values were significantly elevated in deceased patients compared to those of living patients.

Mean platelet volume, platelet distribution width, and platelet count-to-total lymphocyte count ratio values were not associated with 7- and 30-day mortality, whereas only elevated red cell distribution width was associated with 30-day mortality [1].

Prediction of mortality in the patient with head trauma is essential. In this study, the effect of mean platelet volume (MPV) on the mortality rate of patients with severe head trauma was studied.

The relationship between mortality and mean platelet volumes of patients with cranial trauma was retrospectively analyzed. 43 patients with head trauma were admitted to the intensive care unit during the study period. 17 patients died (Group I), 26 survived (Group II). Cox regression analysis showed that late MPV (at exitus or discharged date), WBC at admission, and age increase the mortality rate 1,770, 1,202, 1,052 times, respectively.

The present study shows that MPV may be a useful predictor of severe traumatic brain injury outcome or mortality [2]

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Palabiyik O, Tomak Y, Acar M, Erkorkmaz U, Tuna AT, Suner KO, Ceylan D. Relationship between platelet indices and red cell distribution width and short-term mortality in traumatic brain injury with 30-day mortality. Rev Assoc Med Bras (1992). 2023 Feb 17;69(1):18-23. doi: 10.1590/1806-9282.00210889. PMID: 36820710.
2)
Kazdal H, Kanat A, Ozdemir B, Ozdemir V, Sulun Y, Guvercin AR, Batcik S, Kanat N. The relationship between mean platelet volume and the mortality of patient severe head trauma; First study. Int J Neurosci. 2022 Sep 29:1-14. doi: 10.1080/00207454.2022.2130296. Epub ahead of print. PMID: 36172796.