Early detection of nonneurologic organ failure in patients with severe traumatic brain injury: Multiple organ dysfunction score or sequential organ failure assessment?

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Abstract

OBJECTIVE: The aim of this study is to compare the discriminant function of multiple organ dysfunction score (MODS) and sequential organ failure assessment (SOFA) components in predicting the Intensive Care Unit (ICU) mortality and neurologic outcome.

MATERIALS AND METHODS: A descriptive-analytic study was conducted at a level I trauma center. Data were collected from patients with severe traumatic brain injury admitted to the neurosurgical ICU. Basic demographic data, SOFA and MODS scores were recorded daily for all patients. Odd's ratios (ORs) were calculated to determine the relationship of each component score to mortality, and area under receiver operating characteristic (AUROC) curve was used to compare the discriminative ability of two tools with respect to ICU mortality.

RESULTS: The most common organ failure observed was respiratory detected by SOFA of 26% and MODS of 13%, and the second common was cardiovascular detected by SOFA of 18% and MODS of 13%. No hepatic or renal failure occurred, and coagulation failure reported as 2.5% by SOFA and MODS. Cardiovascular failure defined by both tools had a correlation to ICU mortality and it was more significant for SOFA (OR = 6.9, CI = 3.6-13.3, \( P < 0.05 \) for SOFA; OR = 5, CI = 3-8.3, \( P < 0.05 \) for MODS; AUROC = 0.82 for SOFA; AUROC = 0.73 for MODS). The relationship of cardiovascular failure to dichotomized neurologic outcome was not significant statistically. ICU mortality was not associated with respiratory or coagulation failure.

CONCLUSION: Cardiovascular failure defined by either tool significantly related to ICU mortality. Compared to MODS, SOFA-defined cardiovascular failure was a stronger predictor of death. ICU mortality was not affected by respiratory or coagulation failures.

KEYWORDS: Multiple organ dysfunction syndrome; organ failure; sequential organ failure assessment; traumatic brain injury

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