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Title:

**Comparison of the accuracy of GCS, GCS-P, and GCS-NT
instruments for determining the level of consciousness for
predicting survival of brain injury patients hospitalized in
Imam Khomeini Hospital in Ilam in 2024-2025**

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Abstract:

Background: Traumatic brain injury (TBI) is one of the most common causes of disability and mortality worldwide. A standard and accurate scale for assessing the level of consciousness is essential. This study aimed to compare and evaluate the performance of **GCS, GCS-P, and GCS-NT** in patients with TBI.

Methods: This descriptive-analytical cross-sectional study was conducted in 2024 on patients with traumatic brain injury, using a convenience sampling method. Patients were assessed using the three tools **GCS, GCS-P, and GCS-NT**. After data collection, the prognostic performance of the tools was analyzed using logistic regression, receiver operating characteristic (ROC) curve plotting, and cutoff point determination. Sensitivity and specificity were also calculated and reported. A significance level of 0.05 was considered.

Results: A total of 210 patients were included. According to logistic regression analysis ($p < 0.001$), the AUC values for GCS, GCS-P, and GCS-NT were **0.995, 0.998, and 0.961**, respectively. The **GCS-P** demonstrated the highest accuracy in predicting in-hospital mortality, with 100% sensitivity and 97.9% specificity. The cutoff point for all three tools was 5.

Conclusion: All three tools—**GCS, GCS-P, and GCS-NT**—are reliable predictors of mortality in patients with TBI; however, **GCS-P** showed the highest accuracy. Patient age was identified as an independent risk factor, while sex and marital status had no significant effect on mortality.

Keywords: Traumatic brain injury, Mortality, GCS, GCS-P, GCS-NT