Kidney disease improving global outcome for predicting acute kidney injury in traumatic brain injury patients

Sara Ramtinfar, Shahrokh Yousefzadeh Chabok, Aliakbar Jafari Chari, Zoheir Reihanian, Ehsan Kazemnejad Leili, Arsalan Alizadeh

- Department of Neurosurgery, Guilan University of Medical Science, Poursina Hospital, Rasht, Gilan, Iran

Received 21 August 2015, Revised 20 August 2016, Accepted 8 September 2016, Available online 27 October 2016

Abstract

Aim: To determine the incidence of acute kidney injury (AKI) based on Kidney Disease Improving Global Outcome (KDIGO) criteria in patients with severe traumatic brain injury and to study AKI in relation to risk factors and outcomes.

Method: This trial was a descriptive analytic study on 83 patients with severe traumatic brain injury admitted to Poursina Hospital (Rasht, Iran). The incidence of AKI was determined based on KDIGO criteria over a 12-month period. The correlation of mortality rates, multi-organ failure (MOF), and neurologic outcome to AKI were studied.

Results: Of 83 eligible patients who entered the study, 25.3% (N = 21) developed AKI based on KDIGO criteria. Glasgow Outcome Scale on admission was the only risk factor significantly associated with the incidence of AKI (p = 0.001). Mortality rates (62% vs. 22.6%, p = 0.002) and the occurrence of MOF were significantly higher in patients who developed AKI (23.8% vs. 0% MOF based on Sequential Organ Failure Assessment, p < 0.0001; 19% vs. 0% MOF based on Multiple Organ Dysfunction score, p < 0.0001). Poor neurologic outcome was observed in 95% and 92% of patients with and without AKI, respectively (p = 0.674).

Conclusion: The incidence of AKI among patients with severe traumatic brain injury is striking. The association of Glasgow Outcome Scale with AKI helps to
identify patients at a higher risk of developing AKI. Significant rates of mortality and MOF among patients with severe traumatic brain injury and AKI, necessitates consideration of renoprotective measures from the early days of hospital admission.

**Keywords:** acute kidney injury; brain–kidney crosstalk; KDIFO; traumatic brain injury