

NOVEL BIOMARKERS OF BRAIN INJURY FOR EARLY OUTCOME PREDICTION IN CARDIAC ARREST SURVIVORS

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Early determination of neurological prognosis in cardiac arrest survivors remains challenging. The aim of our study was to compare prognostic values of guidelines-recommended neuron-specific enolase (NSE) with novel biomarkers serum tau protein (Tau) and neurofilament light chain (Nfl) at different timepoints after cardiac arrest.

Eligible subjects for this single-center prospective study were out-of-hospital cardiac arrest survivors. NSE, Tau and Nfl levels were measured at 24 hrs (D1), 48 hrs (D2), 72 hrs (D3), and 96 hrs (D4) after hospital admission. Prognostic values of NSE, Tau and Nfl for the prediction of poor outcomes were determined using ROC analysis. Poor outcome was defined as Modified Rankin Scale (mRS) 4-6.

A total of 43 cardiac arrest survivors were enrolled. The area under the ROC curve (AUC) for NSE was 0.776 at D1, 0.911 at D2, 0.982 at D3, and 1.0 at D4 (all $P < 0.001$). The AUC for Tau was 0.823 at D1, 0.893 at D2, 0.938 at D3, and 0.980 at D4 (all $P < 0.001$). The AUC for Nfl was 0.614, $P = 0.232$ at D1, 0.782, $P = 0.001$ at D2, 0.969, $P < 0.001$ at D3, and 0.990, $P < 0.001$ at D4. Tau has the highest sensitivity for the prediction of poor prognosis with 100% specificity at D1 or D2 and NSE at D3 or D4.

Our results indicate that the novel biomarkers Tau and Nfl have comparable predictive value for clinical outcomes as NSE at 48 to 96 hrs after cardiac arrest. Predictive value at 24 hrs was highest with Tau.

Keywords: Cardiac arrest, Outcome prediction, Neuron-specific enolase, Serum tau protein, Neurofilament light chain.

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