

Neuron-specific enolase and S100BB as outcome predictors in severe diffuse axonal injury

Abstract

BACKGROUND

Diffuse axonal injury (DAI) is a common type of traumatic brain injury, mostly associated with mild changes on computed tomography (CT) scan. Serum biomarkers might be used in the diagnosis and prognosis of this injury type. Our purpose was to determine temporal profile and predictive values of serum concentrations of protein S100BB and neuron-specific enolase (NSE) after DAI.

METHODS

Twenty-eight isolated severe DAI patients (Glasgow Coma Scale score ≤ 8) with normal CT were enrolled in the study. Serum levels of S100BB and NSE were determined at 6 hours, 24 hours, 48 hours, and 72 hours after injury, using enzyme-linked immunosorbent assay. Clinical outcome variables of DAI comprised survival at discharge and Glasgow Outcome scale (GOS) after 3 months and also 2 years.

RESULTS

S100BB concentration was maximum in 6 hours after injury (median = 280.75 ng/L) followed by a quick drop. Its value was significantly higher on third day in patients with unfavorable outcome (GOS score = 1-3) versus favorable outcome (GOS score = 4, 5) ($p < 0.0001$). The values of NSE had mild changes during 3 days; however, these measured values at 72 hours after trauma manifested higher in unfavorable outcome ($p < 0.05$).

CONCLUSIONS

Increased serum concentrations of NSE and S100BB within first 3 days after DAI are associated with poor outcome despite mild CT findings. S100BB level at 72 hours after injury can predict late outcome in DAI patients.

LEVEL OF EVIDENCE

Prognostic study, level III.

KEY WORDS: Diffuse axonal injury; neuron-specific enolase; S100BB; severe traumatic brain injury; outcome.