Introduction

Neuroglobin has been described as a neuroprotective agent when overexpressed in traumatic brain injury (TBI), Nogo-A has also shown an important role in axonal remodeling after TBI, and therefore they have the potential to impact outcomes after TBI. Thus, we investigated early changes in the concentrations of serum neuroglobin and Nogo-A after TBI and evaluated the relations of both neuroglobin and Nogo-A to injury severity and prognosis.

Methods

Thirty-four patients with TBI were included in this study. Serum samples were obtained on admission and at 6, 12, 24, 48, 72, and 96 h after injury. Serum concentrations of neuroglobin and Nogo-A were measured by using the enzyme linked immunosorbent assay (ELISA) method and comparative analysis combined with Glasgow Coma Scale (GCS) scores and the 6-month prognosis of the patients were performed. Receiver operating characteristic (ROC) curve was used to appraise the value of serum neuroglobin and Nogo-A levels in predicting the prognosis of patients with TBI.

Results

The serum neuroglobin concentrations increased for 48 h after injury and sharply decreased thereafter, whereas serum concentrations of Nogo-A increased and reached a peak at 72 h, after which it decreased gradually. The mean peak serum concentrations of neuroglobin and Nogo-A in patients with severe TBI was significantly higher than that in patients with mild TBI ($P<0.05$). Significant correlations were found between peak serum neuroglobin and Nogo-A concentrations and a patient's GCS score on admission ($P<0.001$). Compared with the better prognosis group at 6 months after injury, the mean peak serum neuroglobin and Nogo-A concentrations were both significantly higher in patients with an unfavorable outcome ($P<0.05$). ROC curve analysis suggested that the serum Nogo-A concentration had a significantly better predictive power for poor prognosis.

Conclusions

Neuroglobin and Nogo-A levels in serum of patients with TBI increased obviously after injury, and were suggested as biomarkers for predicting brain injury severity and poor prognosis.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the importance of evaluating the severity and predicting the prognosis of traumatic brain injury, 2) Discuss, in small groups, 3) Identify an effective treatment for traumatic brain injury.

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