Prognostic implications of early somatosensory evoked potentials in patients with traumatic brainstem injury

Yirui Sun MD, PhD; Jin Hu; Ying Mao MD; Liangfu Zhou
[Department of Neurosurgery, Huashan Hospital, Fudan University, Shanghai ,China]

Introduction

Brainstem injuries are often accompanied by severe traumatic brain injury (TBI) and associated with poor outcomes. Glasgow Coma Scale (GCS) and computed tomography are routine exams in the acute setting, yet they have been criticized for not accurately predicting outcomes of brainstem injuries. Our preliminary research on the Somatosensory Evoked Potentials (SEP) Scale suggests it overcomes such limitation. The aims of this study were to: examine correlations between early SEP recordings and functional/cognitive outcomes in patients with brainstem injury.

Methods

A prospective cohort study conducted on adult TBI patients in three university affiliated hospitals. SEP scores assigned at 24h, 72h, and one week after injury. Functional outcome measured by Glasgow Outcome Scale, functional independence measure scores, and Weschler Memory Scale scores one year post-injury.

Results

SEP recordings were obtained from 42 comatose patients with traumatic brainstem injuries (Initial GCS<=8). Mean age 45.4. We found 24 and 72 h SEP scores correlated with functional outcome ($r_s = 0.24, p = 0.03$; $r_s = 0.39, p = 0.02$). Over ninety percent (91.1% to date) of patients with bilaterally absent SEPs during acute phases of injury showed poor outcome. Patients with unilateral present SEPs or with bilaterally present but abnormal SEPs, had better outcomes. Patients whose SEP grades improved between days 1 and 7, had marginally better functional outcome than those without.

Conclusions

Early SEPs are valuable in terms of predictive ability for neurological outcomes for patients with brainstem injuries.

Learning Objectives

Results of our study have the following implications: 1) SEPs are valuable outcome predictor in acute phase for patients with brainstem injuries. 2) Caution is recommended in predicting unfavourable outcomes in severe TBI patients with an absence of bilateral SEPs. Absence of SEPs cannot be considered as the only indicator of withdrawing treatment.