Prognostic Serum Factors in Traumatic Brain Injury: A Systematic Review

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Abstract

Background & Aim: Traumatic brain injury is one of the main causes of death and disability. The aim of this study is to systematically review the articles which assessed some serum factors of traumatic brain injury patients in relation to their outcomes.

Methods & Materials/Patients: Databases were searched for relevant publications from 2005 to 2014. Selection criteria were: Studies which evaluate the factors affecting the outcome after TBI, TBI defined as “acute changes in brain function resulting in a strong external force to the head”. Results were measured by Glasgow Outcome Score or a comparable measure. Factors were measured in first month after injury and the prognosis was addressed. All papers were checked and approved by a specialist and expert in that field. A systematic review was performed for prognostic factors.

Results: Sixty-three studies were included. Most studies used Glasgow Outcome Score at 6 months post-injury as outcome measure, sometimes in combination with other outcome measures. Strong evidence for predicting outcome was found for serum concentration of S100 protein, NSE, MBP, NF-H, GFAP, UCH-L1, blood glucose levels, serum levels of LDH, sodium level, prothrombin time, partial thromboplastin time, platelet count, D.dimer, HSP 70, serum levels of IL-8, number of circulating EPCs, and DNA levels in serum. Moderate evidence for
predicting outcome was found for high serum MMP9. Strong evidence of no association was found for WBC count and serum cortisol levels. Moderate evidence of no association was found for serum total cholesterol for other determinants, inconclusive or no evidence or limited evidence was found.

**Conclusion:** S100 protein, NSE, MBP, NF-H, GFAP, UCH-L1, blood glucose levels, serum levels of LDH, sodium level, prothrombin time, Partial thromboplastin time, platelet count, D.dimer, HSP 70, serum levels of IL-8, number of circulating EPCs, and DNA levels in serum predicted outcome after traumatic brain injury. WBC count, serum cortisol levels, total cholesterol and MMP9 did not have predictive value.

**Keywords:** Prognostic; Serum Factors; Traumatic Brian Injury