CSF Biomarkers To Predict Injury Severity And Neurological Recovery In Traumatic Spinal Cord Injury: A Systematic Review

Annisa Nur Insani[1], Bunga Vidya Prajnanta[1], Goldy Natanael[1], Nitya Fithra Salsabila Alhaque[1]

[1] Universitas Pembangunan Nasional Veteran Jakarta

Introduction Spinal cord injury (SCI) is a catastrophic condition that can reduce the quality of life of a patient. Every SCI patient has their own severity which can be assessed by a standardized method. The examination requires acute SCI patients to be conscious and cooperative. However, many patients cannot be examined reliably upon arrival because of concomitant injuries or pharmacological sedation. Recent biomolecular studies of cerebrospinal fluid (CSF) components have led us to the finding of substances that are seen as a potential indicator of patients' prognosis.

Objectives This systematic review aims to study the usage of CSF biomarkers as a potential tool in predicting injury severity and future neurological recovery of SCI patients.

Methods To identify the relevant studies, the authors used five databases: PubMed, Scopus, Science Direct, PLOS ONE, and Proquest. The database search identified 438 articles from the five sources mentioned and other sources; 24 articles matched the title and abstract, yet only 7 articles met the inclusion criteria to be further reviewed. Included articles were assessed with CEBM Level of Evidence.

Results Seven studies were reviewed with a total sample of 280 patients. Studies showed an overall increase of CSF inflammatory protein concentrations in the acute phase of injury with various concentrations in each AIS or Frankle grade. We found that biomarker concentrations were negatively correlated with improvement in AIS grade. The high concentrations of biomarkers are associated with more severe injury and a lesser chance of neurological recovery.

Correspondence to:
Annisa Nur Insani
Universitas Pembangunan Nasional Veteran Jakarta, Indonesia

annisainsani06@gmail.com

Conclusion CSF biomarkers can be a useful tool to classify patients' severity and predict neurological recovery. This leads to a more comprehensive approach in the evaluation and treatment of spinal cord injury cases.