

Role of prognostic biomarkers in a prospective cohort of 400 severe traumatic brain injury patients admitted to intensive care units in Southern Brazil

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Objective: Brain trauma is among the leading cause of mortality and disability in the western world. Despite the burden of the disease, there are no optimal outcome predictors for severe TBI. Therefore, in this cohort of severe TBI patients we investigated (i) clinical and epidemiological prognostic factors and (ii) a panel of potential biomarkers and whether their levels were associated to with primary short-term outcome (death or Intensive Care Unit discharge).

Methods: From September 2008 to September 2011, 443 patients with severe TBI [Glasgow Come Scale (GCS) 3–8 at emergency room admission] were enrolled in this prospective study. Clinical variables investigated included: age, sex, mechanism of injury, pre-hospital care, field intubation, GCS scores, time between emergency room admission and transfer to ICU, craniotomy, ICP monitorization, sedation, use of mannitol, hypertonic saline solution or vasopressor, and organ donation. Blood sample were taken at admission to the ICU and processed to serum and/or plasma and the levels of cell free DNA and RNA, S100B, BDNF, Hsp70, ferritin, C-reactive protein, Von Willebrand factor, MMP 2 and 9, cytokines, GFAP were determined.

Results: Severe TBI patients presented a mean age of 36 years and a mortality rate of 25%. The panel of biomarkers investigated pointed cell-free DNA as the most promissory prognostic marker considering ROC analysis. Nevertheless, S100B, BDNF, Hsp70, ferritin, von Willebrand factor and IL-6 levels were associated to primary short-term outcome.

Conclusions: Brain damage following traumatic injury is a result of direct (immediate mechanical disruption of brain tissue, or primary injury) and indirect (secondary or delayed) mechanisms. Thus, investigation of biomarkers to predict prognosis in acute brain injury may indicate patients at higher risk for deterioration as well as guide new therapeutical strategies in neurointensive care.

Biography

Andrea Regner graduated in Medicine, in 1995, at the Federal University of Rio Grande do Sul (UFRGS) at the age 23 and completed her Ph.D in Biochemistry at UFRGS at the age of 27 years. She is a director of the Emergency of Hospital Nossa Senhora da Conceição in Porto Alegre, a reference for emergency care in Southern Brazil. Since 2001, she is a Medicine and Postgraduate Professor in Universidade Luterana do Brasil. She has been investigating neurochemical aspects of brain injury and has published more than 25 papers in reputed journals.

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