

## **BIOMARKERS ARE USEFUL IN TRAUMATIC BRAIN INJURY**

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Traumatic brain injury (TBI) is characterized by high rates of case fatality (15-20% in moderate TBI and 40% in severe TBI) and disability in survivors (30-40% in moderate and 50-60% in severe TBI). Accurate determination of the initial severity of the primary brain damage is imperative in establishing a prognosis and to weigh risks and benefits of specific treatment options. Current prognostic models for TBI, which incorporate various patient characteristics and clinical measures, do not show sufficiently high sensitivity or specificity in predicting outcomes. Current models predicting TBI outcome reach only a 70-80% accuracy which is insufficient in individual patients. Biological indicators in blood of pathological conditions in other body organs like kidney, liver and heart are clearly useful in diagnosis, prognosis and monitoring effectiveness of treatment. The specific situation of blood brain barrier disruption in TBI causes release of brain specific proteins, including injury markers, from the brain to the peripheral circulation. This facilitates research into biomarkers for TBI. Previously, we showed that serum levels of astroglial proteins like GFAP and S100B in patients with severe TBI predict death and unfavorable outcomes. Also other studies exist on biomarkers in TBI. A common finding is that they all were relative small studies but that consistently the markers added prognostic value to clinical models. In a study published in *Neurology* 2010, we aimed to validate the prognostic capabilities of GFAP and S100B in people with moderate and severe TBI. In a relatively small sample of 79 moderate to severe TBI patients we confirmed that GFAP and S100B levels in serum are powerful adjuncts to the clinical assessment of brain damage and powerful predictors of outcome after TBI.

It will be therefore scientifically very interesting to study the role of biomarkers in larger numbers of patients. What I would hypothesize is that we can obtain cutoff values for GFAP and S100B and other brain damage markers for TBI that exhibit a small false-positive rate for death or unfavorable outcomes.