

Quick Review of Model System Research

Chronic Inflammation After Severe Traumatic Brain Injury: Characterization and Associations With Outcomes 6 and 12 Months Postinjury¹

What is the study about?

This study looked at how inflammation affects the outcomes of patients with traumatic brain injury (TBI) during the first year after the injury. A better understanding of the effects of inflammation may lead to new screening, early intervention, treatment, and therapeutic options.

Who participated in the study?

The study examined two groups of adults, 16–70 years of age: study group and control group. The study group included 87 patients with severe closed-head TBI. These patients were admitted to a large medical center. A computed tomography scan revealed that all patients had intracranial damage. All patients scored 8 points or lower on an initial Glasgow Coma Scale. This scale measures a person's conscious state. The control group included seven healthy adults with no history of brain injury, neurological disease, or bleeding disorder. This group was included for serum biomarker analysis.

How was the study conducted?

Between 6 and 12 months after the injury, researchers collected blood samples from patients every 2 weeks. Using these samples, researchers analyzed and compared levels of different types of inflammatory responses (pro- and anti-inflammatory cytokines). They also kept data on the nature and severity of the injuries. Researchers used the Glasgow Outcome Scale to measure the outcomes of patients 6 and 12-months after the injury. This tool rates a patient's level of recovery on a 5-item scale.

What did the study find?

Levels of inflammation remained high in patients with severe TBI during the first year after the injury. High levels of inflammation during the first 90 days after TBI generally lead to less favorable outcomes at 6 and 12 months of recovery. This study suggests that TBI can contribute to a chronic inflammatory response. An understanding of both the acute and long-term inflammatory responses following TBI will help researchers know where and when to focus their therapeutic intervention efforts. Furthermore, long-term inflammation is associated with such conditions as fatigue, depression, anxiety, migraine, seizures, and thoughts about suicide. Many of these conditions commonly occur after TBI. Thus, the chronic inflammatory response observed in this analysis may be related to the development of secondary complications from TBI.

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¹ Kumar, R., Boles, J., & Wagner, A. (2014). Chronic inflammation after severe traumatic brain injury: Characterization and associations with outcome at 6 and 12 months postinjury. *Journal of Head Trauma Rehabilitation*.