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LETTER

Elevated Serum Complement C1q Levels After Traumatic Brain Injury [Letter]

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Dear Editor

We have read with great interest the recent paper by Yan et al,[1] published in *Neuropsychiatric Disease and Treatment*, discussing complement elements and prognosis in traumatic brain injury (TBI). Trauma is the leading cause of death in people aged 1–44 years. TBI is the main determinant of morbidity, disability, and mortality within this group.[2] Severe TBI is associated with a mortality rate of 30–70%,[2] and recovery in survivors is marked by severe neurological sequelae and a very impaired quality of life.[3] TBI translates into neuronal cell death, brain edema, and blood–brain barrier disruption, through primary and secondary injuries. An intense systemic inflammatory response, affecting both traumatized and healthy brain tissue, is frequent in TBI.[4] The inflammatory stress response includes complement activation and up-regulation of adhesion molecules on the endothelium of brain vessels associated with neutrophil accumulation and cytokine production.[5] However, the real prognostic value of the complement system in patients with TBI is not well defined.[6]

The complement system consists of an enzyme "cascade" that helps defend against infections. Many proteins of the complement system occur in serum as inactive enzyme precursors (zymogens); others are found on cell surfaces.[4,6,7] The C1q complement system seems to be an important element in secondary brain injury.[1]

In the article by Yan et al,[1] they describe the relationship between serum complement C1q levels and the severity of TBI and prognosis after TBI. This is a prospective study with a 6-month outcome analysis. It is especially exciting to have a new prognostic factor for patients with severe TBI. Serum C1q has an inversely proportional relationship with Glasgow Coma Scale (GCS) and Extended Glasgow Outcome Scale (GOSE) scores, configuring the complement system as a prognostic predictor and starting point from which to develop new therapeutic approaches.

However, despite the multivariate analysis, some important facts were not included.

Based on the analysis of this paper, we have highlighted three important points to be discussed:

Seventy-nine patients had abnormal cisterns and another 75 had a midline displacement greater than 5 mm, indicating critical cases of TBI. However, 87 had an epidural hematoma, which usually has a good prognosis, and this proportion of epidural hematomas appears to be very high compared to a level 1 trauma center.

A second point concerns the best time to collect blood for complement system analysis. In the published sample, the time of collection varied considerably. Perhaps a standardization of the time of blood collection could result in more accurate data on the prognostic role of C1q in TBI.

A third aspect is about the acute subdural hematoma that was reported in 111 patients; however, there was no mention of surgical treatment, generating a question about surgical or conservative management, a fact that affects the final outcome and prognosis. Important information, such as injuries associated with TBI, will have an impact on management and may facilitate the understanding of the true role of C1q complement in neuroinflammation. These small caveats, however, do not take away the main relevant messages and discussion raised by Yan et al.

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Disclosure

The authors report no conflicts of interest in this communication.

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