

Study examines neurological outcomes for TBI treatments

July 1 2014

In patients with a traumatic brain injury (TBI), neither the administration of the hormone erythropoietin (EPO) or maintaining a higher hemoglobin concentration through blood transfusion resulted in improved neurological outcome at 6 months, according to a study in the July 2 issue of *JAMA*. Transfusing at higher hemoglobin concentrations was associated with a higher risk of adverse events.

Patients with severe [traumatic brain injury](#) commonly develop anemia. For patients with neurological injury, anemia is a potential cause of secondary injury, which may worsen neurological outcomes. Treatment of anemia may include transfusions of packed red blood cells or administration of [erythropoietin](#). There is limited information about the effect of erythropoietin or a high hemoglobin transfusion threshold (if the hemoglobin concentration drops below a certain level, a transfusion is performed) after a TBI, according to background information in the article.

Claudia S. Robertson, M.D., of the Baylor College of Medicine, Houston, and colleagues conducted a [randomized clinical trial](#) that included 200 patients (erythropoietin, n = 102; placebo, n = 98) with a closed head injury at neurosurgical intensive care units in two U.S. level I trauma centers between May 2006 and August 2012. Patients were enrolled within 6 hours of injury and had to be unable to follow commands after initial stabilization. Erythropoietin or placebo was initially dosed daily for 3 days and then weekly for 2 more weeks (n = 74). There were 99 patients assigned to a hemoglobin transfusion

threshold of 7 g/dL and 101 patients assigned to 10 g/dL.

In the placebo group, 34 patients (38.2 percent) recovered to a favorable outcome (defined as good recovery and moderate disability, as measured by a functional assessment inventory) compared with 17 patients (48.6 percent) in the erythropoietin 1 group (first dosing regimen) and 17 patients (29.8 percent) in the erythropoietin 2 group (second dosing regimen). Thirty-seven patients (42.5 percent) assigned to the transfusion threshold of 7 g/dL recovered to a favorable outcome compared with 31 patients (33.0 percent) assigned to the transfusion threshold of 10 g/dL.

There was a higher incidence of thromboembolic events for the [transfusion](#) threshold of 10 g/dL (21.8 percent) vs (8.1 percent) for the threshold of 7 g/dL.

"Among patients with closed head injury, neither the administration of erythropoietin nor maintaining [hemoglobin concentration](#) of at least 10 g/dL resulted in improved neurological outcome at 6 months. These findings do not support either approach in [patients](#) with traumatic brain injury," the authors conclude.

More information: [DOI: 10.1001/jama.2014.6490](https://doi.org/10.1001/jama.2014.6490)

Provided by The JAMA Network Journals

Citation: Study examines neurological outcomes for TBI treatments (2014, July 1) retrieved 19 November 2023 from <https://medicalxpress.com/news/2014-07-neurological-outcomes-tbi-treatments.html>

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