ProTECT: A Randomized Clinical Trial of Progesterone for Acute Traumatic Brain Injury

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Abstract

Study objective

Laboratory evidence indicates that progesterone has potent neuroprotective effects. We conducted a pilot clinical trial to assess the safety and potential benefit of administering progesterone to patients with acute traumatic brain injury.

Methods

This phase II, randomized, double-blind, placebo-controlled trial was conducted at an urban Level I trauma center. One hundred adult trauma patients who arrived within 11 hours of injury with a postresuscitation Glasgow Coma Scale score of 4 to 12 were enrolled with proxy consent. Subjects were randomized on a 4:1 basis to receive either intravenous progesterone or placebo. Blinded observers assessed patients daily for the occurrence of adverse events and signs of recovery. Neurologic outcome was assessed 30 days postinjury. The primary safety measures were

differences in adverse event rates and 30-day mortality. The primary measure of benefit was the dichotomized Glasgow Outcome Scale–Extended 30 days postinjury.

Results

Seventy-seven patients received progesterone; 23 received placebo. The groups had similar demographic and clinical characteristics. Laboratory and physiologic characteristics were similar at enrollment and throughout treatment. No serious adverse events were attributed to progesterone. Adverse and serious adverse event rates were similar in both groups, except that patients randomized to progesterone had a lower 30-day mortality rate than controls (rate ratio 0.43; 95% confidence interval 0.18 to 0.99). Thirty days postinjury, the majority of severe traumatic brain injury survivors in both groups had relatively poor Glasgow Outcome Scale–Extended and Disability Rating Scale scores. However, moderate traumatic brain injury survivors who received progesterone were more likely to have a moderate to good outcome than those randomized to placebo.

Conclusion

In this small study, progesterone caused no discernible harm and showed possible signs of benefit.