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Outcomes of Severe Traumatic Brain Injury Treated with or without Intracranial Pressure Monitoring

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Introduction

Although intracranial pressure (ICP) monitoring is the standard of care for patients with severe traumatic brain injury (TBI), its routine use has recently been questioned on the basis of the BEST:TRIP trial. In fact, this recently published trial concluded that TBI patients who underwent ICP monitor placement did not have better outcomes compared to those receiving medical treatment only. However, several concerns were raised regarding the generalizability of the trial. Therefore, we studied the effect of ICP monitor placement on in-hospital mortality in adult patients with severe TBI in the US.

Methods

We used the Pennsylvania Trauma System Foundation database and included all TBI patients greater than 18 years of age and a Glasgow Coma Scale (GCS) <9 from January 2000 until December 2017. Patients who were dead on arrival were excluded from the analysis. The primary outcome was in-hospital mortality.

Results

A total of 36,929 patients were included in the analysis. The mean age was 45.9 years and 26.4% (n=9,734) were females. The proportion of patients who had ICP monitor placement was 16.3% (n=6,025); 69.9% (n=25,821) were discharged from the hospital alive. There was no difference in GCS score between those with and without ICP monitor placement (mean=3.9 for both groups, P=0.159). Patients who underwent ICP monitor placement had a higher injury severity score (ISS) (mean=31.6 vs. 21.4, P<0.001). When controlling for age, sex, and GCS score on arrival, and ISS, the use of ICP monitoring was not associated with significant improvement of in-hospital mortality (OR=0.96, P=0.19).

Conclusions

Our data failed to show any benefit in in-hospital mortality with the use of ICP monitors in patients with severe TBI. Additional studies are needed to determine how best to integrate ICP monitoring in the management of patients with severe TBI.

Learning Objectives

By the conclusion of this session, participants should be able to:

1) Describe the evidence of ICP monitoring in severe TBI patients

2) Identify that while ICP monitoring is the standard of care in severe TBI patients, its efficacy in improving mortality has not been sufficiently assessed.

References

Chesnut RM, Temkin N, Carney N, et al. A trial of intracranial-pressure monitoring in traumatic brain injury. N Engl J Med. 2012;367(26):2471-2481.