

Degree of Midline Shift at Presentation Affects Long-Term Outcomes in Cases of Traumatic Brain Injury: A  
Secondary Analysis of the Phase 3 COBRIT Clinical Trial

Ross Puffer MD; John K. Yue MD; Matthew Mesley MD; Julia Billigen RN; Jane Sharpless MS; Anita Lynn Fetzick; Ava  
Puccio RN; Ramon Diaz-Arrastia MD, PHD; David O. Okonkwo MD, PhD

Introduction

Following traumatic brain injury (TBI), midline shift is often caused by space occupying lesions leading to increased intracranial pressure and worsened morbidity and mortality. Outcome has been studied in this population, recovery trajectory in these patients has not been reported. We utilized the COBRIT trial to analyze subject recovery over time depending on degree of midline shift at presentation.

Methods

Subject data from the COBRIT trial were stratified into groups of midline shift, and outcome measures were analyzed at 30, 90 and 180 days post-injury. Recovery trajectory analysis was performed identifying patients with outcome measures at all time points, analyzing the degree of recovery based on midline shift at presentation.

Results

There were 896, 1196, and 895 subjects with adequate outcome data at 30, 90 and 180 days, respectively. Rates of favorable outcome (GOS-E 4-8) at 6 months post-injury were 87% (no midline shift), 79% (1-5mm shift), 64% (6-10mm shift) and 47% (>10mm shift). The mean improvement from unfavorable outcome (GOS-E 2-3) to favorable outcome (GOS-E 4-8) from 1-month to 6-months in all groups was 20%. The mean GOS-E of subjects in the 6-10mm group crosses from unfavorable outcome into favorable outcome at 90 days, and the mean GOS-E of subjects in the >10mm group nearly reaches the threshold of favorable outcome by 180 days post-injury.

Conclusions

In this secondary analysis of the COBRIT trial, TBI subjects with <10mm of midline shift on admission head CT had significantly improved functional outcomes through 180 days after injury compared to those with greater than 10mm of midline shift, however nearly 50% of patients with 10mm of midline shift will achieve a favorable outcome (GOS-E 4-8) by 6 months post-injury. Subjects with a unfavorable outcome (GOS-E 2-3) at 30-days should continue close observation as approximately 20% will improve to a favorable outcome by 6-months post-injury.

Learning Objectives

- Degree of midline shift at presentation affects long term outcome
- Mean GOS-E improves over time in all categories of midline shift
- 6 month assessment post-TBI is not long enough for final follow-up, as many of these patients may continue to improve
- Nearly 50% of patients with >10mm of midline shift at presentation will go on to have a favorable outcome.

References

Available Upon Request