Impact of medical and neurological ICU complications on moderate-severe traumatic brain injury (TBI)

Susanne Muehlschlegel
*University of Massachusetts Medical School*

*Et al.*
IMPACT OF MEDICAL AND NEUROLOGICAL ICU COMPLICATIONS ON MODERATE-SEVERE TRAUMATIC BRAIN INJURY (TBI)

Susanne Muehlschlegel, MD, MPH\(^1\,2\,3\); Raphael Carandang, MD\(^1\,3\); Cynthia Ouillette, RN\(^1\); Wiley Hall, MD\(^1\,3\); Fred Anderson, PhD\(^3\,4\); Robert Goldberg, PhD\(^5\)

Departments of \(^1\)Neurology (Div. Neurocritical Care), \(^2\)Anesthesia/Critical Care and \(^3\)Surgery; \(^4\)Center for Outcomes Research; \(^5\)Department of Quantitative Health Sciences (Div. Epidemiology of Chronic Diseases), University of Massachusetts Medical School, Worcester, MA

Contact information:
Susanne Muehlschlegel, MD, MPH
Email: susanne.muehlschlegel@umassmemorial.org
Phone: 508-856-4684

Abstract:

Certain admission characteristics are known predictors of adverse outcomes in patients with moderate-severe TBI, but explain only 1/3 of outcome variability. Intensive care unit (ICU) complications occur frequently in this population, but their impact on patient outcomes remains poorly defined. In a prospective observational cohort study of 170 consecutive moderate-severe TBI patients admitted to Level I trauma center (UMASS) over the period 11/2009–2/2012, we examined the association of ICU complications and 3-month outcome (Glasgow Outcome Scale [GOS]). The mean age was 51 years, 72% were men, and the median GCS and injury severity scores were 4 and 29, respectively. Using multiple logistic regression analysis, hypotension requiring vasopressors (HRV) was the strongest predictor of poor outcome (GOS 1-3 [OR 2.8; 95% CI 1-7.5]) among medical complications. After combining medical with neurological ICU complications, brain herniation (OR 5.8; 95% CI 1.1-30.2) and intracranial rebleeding (OR 2.9; 95% CI 1.1-8.4) were the strongest predictors of poor outcome, while HRV approached significance (OR 2.4; 95% CI 0.9-6.4). We identified important potentially modifiable predictors of adverse outcomes after moderate-severe TBI. Confirmation of our findings in a larger cohort is warranted.