Severe pediatric traumatic brain injury

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Two hundred and twenty-four children had severe TBI and 75% underwent intracranial pressure monitoring either in the ED, operating room (OR) or paediatric intensive care unit.

Four out of five centres placed ICP monitors in the ED, mostly (83%) fibreoptic. Nearly 40% of the patients who received ICP monitors get it placed in the ED (29% overall). Factors associated with ED ICP monitor placement were as follows: age 13 to <18 year olds compared to infants (aRR 2.02; 95% CI 1.37, 2.98), longer ED length of stay (LOS) (aRR 1.15; 95% CI 1.08, 1.21), trauma centre designation paediatric only I/II compared to adult/paediatric I/II (aRR 1.71; 95% CI 1.48, 1.98) and higher mean paediatric TBI patient volume (aRR 1.88;95% CI 1.68, 2.11). Adjusted for centre, higher bedside ED staff was associated with longer ED LOS (aRR 2.10; 95% CI 1.06, 4.14).

ICP monitors are frequently placed in the ED at paediatric trauma centres caring for children with severe TBI. Both patient and organizational level factors are associated with ED ICP monitor placement [1)].

Severe Pediatric Head Injury During the Iraq and Afghanistan Conflicts

Much has been written about injuries sustained by US and coalition soldiers during the Global War on Terrorism campaigns. However, injuries to civilians, including children, have been less well documented.

A retrospective review of children (<18 years old) in the Joint Theater Trauma Registry with isolated head injury (defined as an Abbreviated Injury Score Severity Code >3) and treated at a US combat support hospital in Iraq or Afghanistan (2004-2012). The primary outcome was in-hospital mortality.

Kilo et al. identified 647 children with severe isolated head injuries: 337 from OEF, 268 from OIF, and 42 nontheater specific. Most were boys (76%; median age = 8 years). Penetrating injuries were most

common (60.6%). Overall, 330 (51%) children underwent a craniotomy/craniectomy; 156 (24.1%) succumbed to their injuries. Admission Glasgow Coma Score was predictive of survival among the entire cohort and each of the individual conflicts. Male sex also significantly increased the odds of survival for the entire group and OEF, but not for OIF. Closed-head injury improved the predictive ability of our model but did not reach statistical significance as an independent factor.

This is the largest study of combat-related isolated head injuries in children. Admission Glasgow Coma Score and male sex were found to be predictive of survival. Assets to comprehensively care for the pediatric patient should be established early in future conflicts [2].

Case series

A total of 71 and 121 patients were included pre- and postimplementation, respectively. Mortality (32% vs 19%; p < 0.001) and length of critical ICP elevation (> 20 mm Hg; 26.3% vs 15%; p = 0.001) decreased after protocol implementation. WeeFIM discharge scores were not statistically different (57.6 vs 58.9; p = 0.9). Hospital LOS (median 19.6 days; p = 0.68) and ventilator LOS (median 10 days; p = 0.24) were unchanged. CONCLUSIONS A multidisciplinary effort to develop, disseminate, and implement an evidence-based TBI treatment protocol at a children's hospital was associated with improved outcomes, including survival and reduced time of ICP elevation. This type of ICP-based protocol can serve as a guide for other institutions looking to reduce practice disparity in the treatment of severe TBI [3].

1)
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2)
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3)
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