Abstract Submission

Submission Title: Association Between Survival and Increases in Prehospital Systolic Blood Pressure After Its Nadir in Major Traumatic Brain Injury: New Findings From the EPIC Study

Reference ID: 0646-000121

Ethical Review

All research presented at NAEMSP® must comply with the federal standards for ethical committee (IRB, IACUC, etc.) review. Please read the following statements and then select the option that best fits your submission:

Option 1: This research has been approved by an institutional ethics review board for human subjects or animal use in research.

Option 2: An institutional ethics review board for human subjects determined the study to be exempt from full board review and approved the study.

If your research does not fit one of these categories, please email the Research Committee Chair, Alix Carter, at alix.carter@gov.ns.ca for additional guidance.

Ethical Review* Option 2

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Disclosure of Information* True

Responsible for Fees* True

Not Serve as Registration* True

Ready for Print* True

Contact Person* True

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Abstract Information

Title* Association Between Survival and Increases in Prehospital Systolic Blood Pressure After Its Nadir in Major Traumatic Brain Injury: New Findings From the EPIC Study

Award Category* Does Not Apply

Abstract / Educational Content Description* Purpose: Little is known about prehospital blood pressure patterns in Traumatic Brain Injury-TBI. In fact, the effect of serial trends in BP during EMS care remains entirely unknown. Using comprehensive, linked data in the Excellence in Prehospital Injury Care (EPIC) TBI Study (NIH: 1R01NS071049; ClinicalTrials.gov-NCT01339702), we evaluated the association between mortality and the magnitude of increase in EMS systolic BP (SBP) after the lowest SBP in major TBI. Methods: All moderate/severe TBI cases (CDC-Barell Matrix Type-1) in the EPIC pre-implementation cohort (before TBI guideline implementation; 1/07-3/14) were evaluated to assess, in detail, a previous preliminary evaluation [exclusions: age10+, died before ED arrival, SBP1-39/300+mmHg, missing SBP (4%)]. Logistic regression was used to determine associations between increases in EMS SBP after the lowest EMS SBP and the probability of death, adjusted for important confounders. Results Among 14,567 included cases, 7696 (male=68%, median age=45) were in the cohort of interest (had an equal or higher SBP recorded subsequent to the lowest SBP). The study group was separated into four cohorts based upon each patient’s lowest prehospital SBP (40-89mmHg; 90-139; 140-159; 160-300). In each cohort, regression identified the association between mortality and any increase after the SBP nadir. Analysis of the probability of death versus SBP increase after the nadir reveal distinct patterns: Hypotensive cohort-Mortality drops significantly if SBP increases after the nadir; the improvement is dramatic with large increases (SBP increases of 40-80mmHg). Normotension-Mortality is slightly reduced with SBP increases; even large increases (i.e., 70-90mmHg) were not detrimental. Mild Hypertension-Mortality decreases with modest SBP increases but large increases (>40mmHg) are associated with higher mortality. Severe Hypertension-Higher mortality with any subsequent increase. Conclusions: The hypotensive and normotensive cohort findings support the concept that restoring/optimizing cerebral perfusion is important in the management of TBI as recommended in the NAEMSP/BTF EMS Guidelines. This conclusion is further supported by the fact that, even among cases with mild hypertension, moderate SBP increases do not appear to be detrimental. These results are also consistent with previous EPIC findings revealing that the optimal SBP in TBI may be much higher than previously thought.

Key Words* Trauma

Study Type* Quantitative Study