
Effect of post-intubation hypotension on outcomes in major trauma patients

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Disclosure

Nothing to disclose

Background

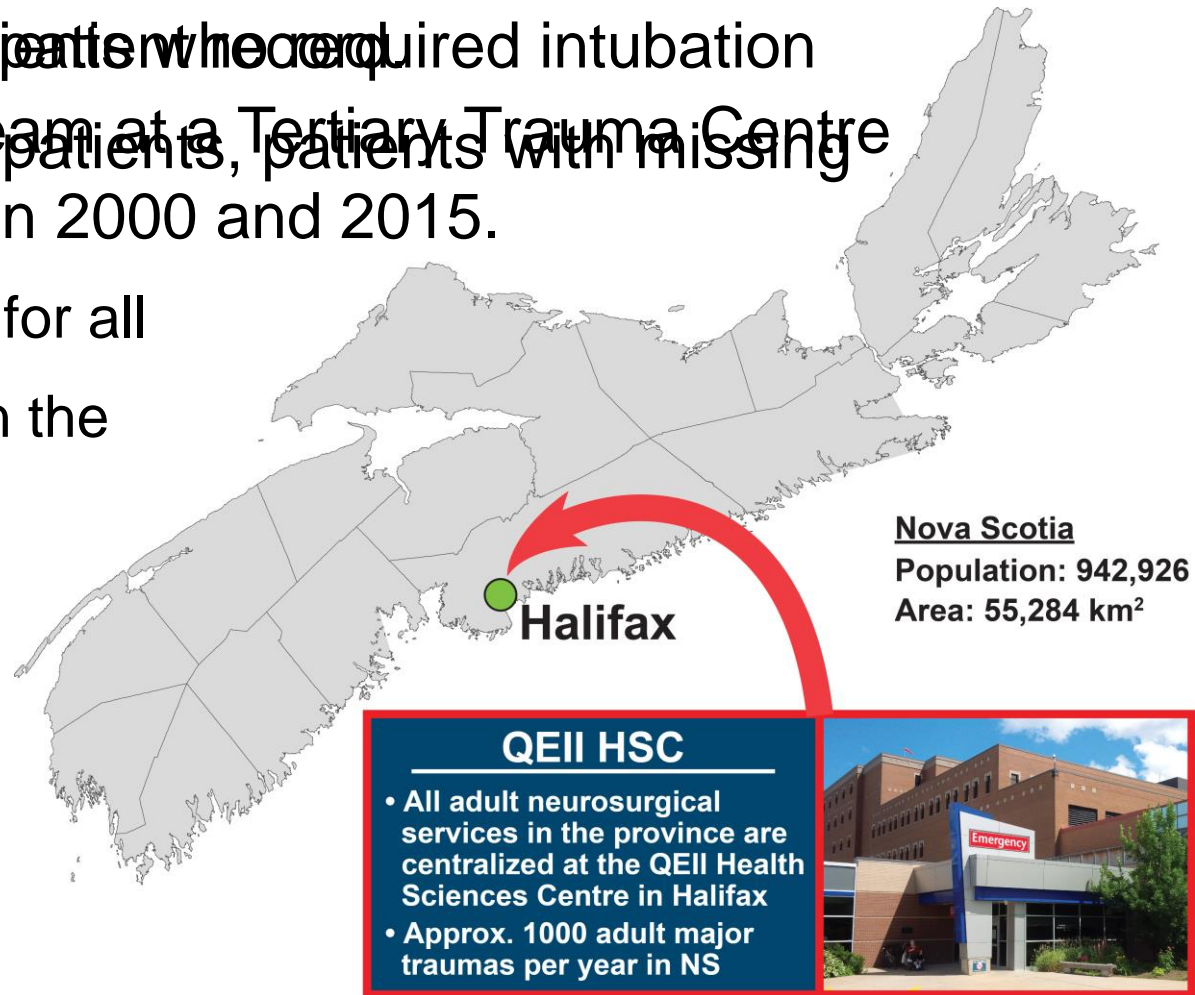
- The most common hemodynamic alteration following ETI is a reduction in systolic blood pressure (SBP) known as post-intubation hypotension (PIH).
- Other investigations of critically ill patients in the intensive care unit (ICU) and emergency department (ED) settings indicate that PIH is:
 - Common (40-60%)
 - Associated with poor patient outcomes (mortality, LOS, requirement for mechanical ventilation)

Background

- The effect of PIH on outcomes in the trauma population is unknown.
- The objective of this study was to determine
 - the prevalence of PIH in adult major trauma patient
 - whether PIH was associated with increased morbidity or mortality

Methods

- Data was collected from the Nova Scotia (NS) Trauma Registry and patients who required intubation by the Trauma Team at a Tertiary Trauma Centre in Halifax between 2000 and 2015.
- Referral center for all major trauma in the provinces of NS and PEI

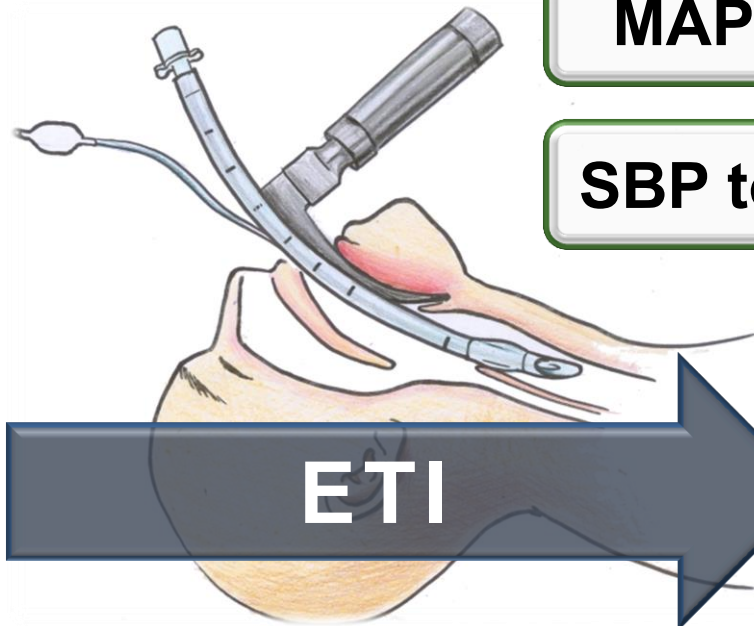


Methods

Data elements collected included:

- Demographics
- Co-morbidities
- Injury type
- Intubation/intubator characteristics
- 15min pre-/post-intubation:
 - All fluids/medications
 - Adverse events & interventions
 - All vital recorded signs
- Requirement for vasopressors, mechanical ventilation, or renal replacement therapy

PIH definition



Pre-ETI hypotension: >5 mmHg

Use of a vasopressor

MAP ≤ 60 mmHg

SBP to ≤ 80 mmHg

PIH?

Post-intubation

0

Time
(minutes)

15

Methods

Primary Outcome:

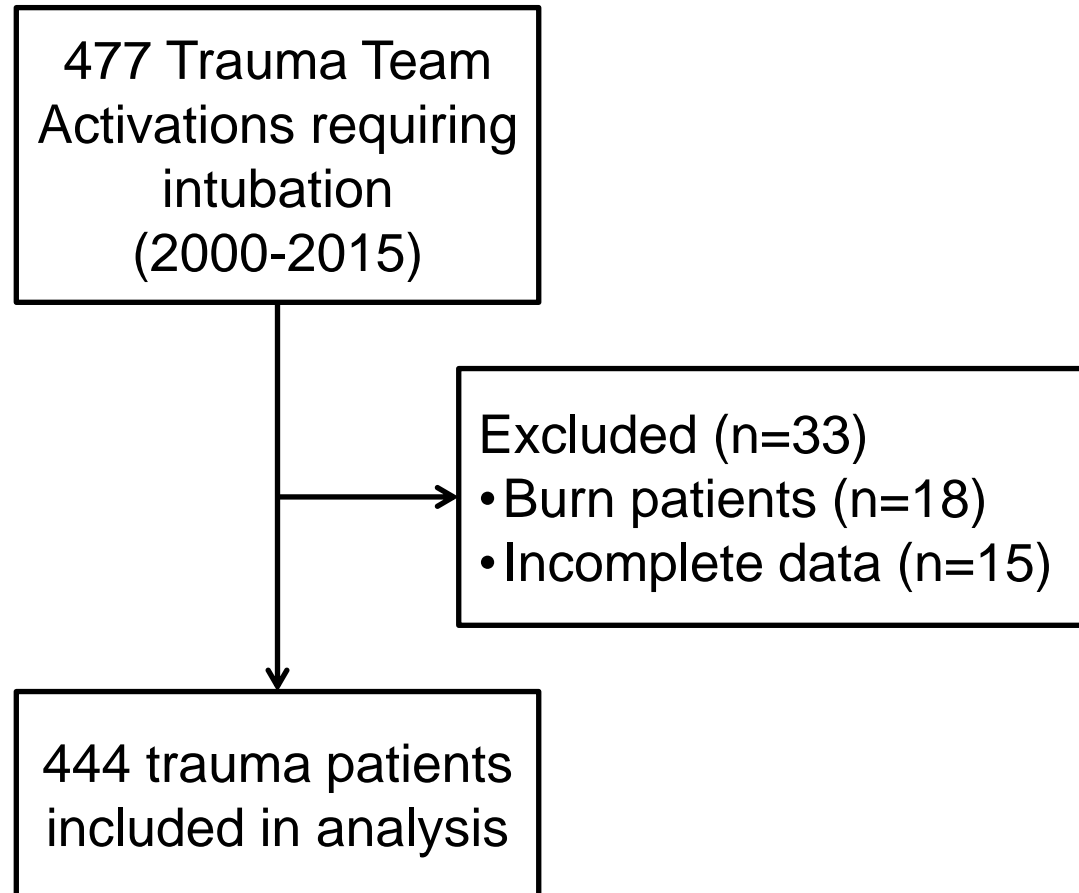
- Prevalence of PIH

Secondary Outcomes:

- Mortality (in-hospital, ED)
- ICU admission
- Length of stay (in-hospital, ICU)
- Renal replacement therapy requirement
- Days requiring positive pressure ventilation, mechanical ventilation, or vasopressor infusions

Results – Study Population

Selection of Participants



Results – Study Population

Characteristics of Study Participants

Characteristic	PIH (n=161)	Non-PIH (n=283)	<i>p</i>
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PIH incidence: 36% (161/444)

Pts who devolved PIH were older (45 y vs. 39 y) and more severely injured (ISS >12)

No difference in intubator, presence of TBI, injury type or fluid resuscitation (30 min window)

Injury type			0.27
Blunt, n (%)	133 (82.6)	245 (86.6)	
Penetrating, n (%)	28 (17.4)	38 (13.4)	
Volume of fluid administered, cc (±SD)	370.2 (705.6)	325.6 (856.4)	0.55

traumatic brain injury defined as Abbreviated Injury Scale Head score ≥3

Results – Patient Outcomes

Outcomes			
Outcome	PIH (n=161)	Non-PIH (n=283)	<i>p</i>

Univariate analysis:
Patients who developed PIH died and required vasopressors more often.

Hospital admission, n(%)	139 (86.3)	265 (93.3)	0.017
ICU LOS, days (SD)	9.3 (10.5)	7.3 (13.2)	0.13
Hospital LOS, days (SD)	25.7 (30.7)	26.6 (38.0)	0.79
Outcome after omitting ED deaths	PIH (n=149)	Non-PIH (n=275)	<i>p</i>
In-hospital mortality, n(%)	36 (24.2)	41 (14.7)	0.018
ICU admission, n(%)	123 (82.6)	245 (87.8)	0.14
Ventilator requirement, n(%)	140 (94.0)	265 (95.3)	0.65
Vasopressor requirement, n(%)	65 (44.2)	67 (25.6)	<0.001

Results – Logistic Regression

Association Between Patient Characteristics and Outcomes*

Characteristic	In-Hospital Mortality	Death in the ED	ICU Admission	Ventilator Requirement	Vasopressor Requirement
PIH	<u>1.83</u> (1.01, 3.31) 0.047	<u>3.45</u> (1.42, 8.36) 0.006	<u>0.38</u> (0.22, 0.68) 0.001	0.79 (0.32, 1.92) 0.60	<u>2.01</u> (1.26, 3.20) 0.003

Multivariate Analysis:

(Controlled for age/gender/intubator/injury/TBI/fluids)

PIH OR for in-hospital mortality 1.83 (1.01-3.31)

*Reported as adjusted odds ratio (95% confidence interval) *p* value.

Model controlled for patient and provider characteristics (age, gender, PIH, provider level, injury type, major trauma, TBI, fluid given [per 1000cc], dose of induction agent).

Limitations

- PIH is multifactorial
 - Intravascular volume and cardiovascular function
 - Medications
 - PPV/respiratory physiology
- Other factors likely important
 - Hypotension
 - Hypoxia
 - Transport time

Conclusion

In our study of trauma patients, development of PIH was common (36%) and associated with increased mortality (OR = 1.83, 95% CI 1.01-3.31).

Clinicians should attempt to minimize hemodynamic instability during ETI in patients with traumatic injuries.

Further investigation of PIH in the trauma population is warranted.

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