Prehospital Management of Pediatric Traumatic Brain Injury

Gregory Faris, MD
Objectives

• Examine the history and significance of pediatric traumatic brain injury
• Discuss the importance of hypoxia in resuscitation of pediatric traumatic brain injury
• Discuss the importance of hypotension in resuscitation of pediatric traumatic brain injury
My two goals

Hypoxia

Hypotension
A little background

- Pediatric head trauma is common

630,000

Faul, M. 2010
A little background

- Pediatric head trauma is common

630,000
60,000

Faul, M. 2010
A little background

- Pediatric head trauma is common
- Pediatric head trauma is deadly

Faul, M. (2010)
A little background

- Pediatric head trauma is common
- Pediatric head trauma is deadly
- Interventions can save lives

Faul, M. 2010
Define severity

- GCS
- AVPU

LEVELS OF CONSCIOUSNESS

A  Alert
V  Verbal Stimuli
P  Painful Stimuli
U  Unresponsive

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Something better?

- Simplified Motor Score
  - Obeys commands
  - Localizes to pain
  - Withdrawals to pain or less response

Gill M 2005
Hypoxia
Hypoxia in Pediatric

TIME TO HEMOGLOBIN DESATURATION WITH INITIAL $F_AO_2 = 0.87$

SaO₂, %

Obese
127 kg
Adult

Normal
10 kg
Child

Moderately Ill
70 kg Adult

Normal
70 kg
Adult

Mean Time to Recovery of Twitch Height From 1 mg/kg Succinylcholine i.v.
Acute Care Clinical Indicators Associated with Discharge Outcomes in Children with Severe Traumatic Brain Injury

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Airway interventions
Airway interventions
Ventilation issue

Hypotension

Neonate <60 mmHg
Infant <70 mmHg
Child <70 + 2x(age)
Child >10yrs <90 mmHg
Hypotension ≠ Hypoxia
Hypotension

6 hours
Hypotension

6 hours

Intervention

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Hypotension

6 hours

Intervention

Mortality

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Hypotension

6 hours

Intervention

Mortality

Improved neurologic outcomes

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Hypotension interventions

Combined effects

The Effect of Combined Out-of-Hospital Hypotension and Hypoxia on Mortality in Major Traumatic Brain Injury

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Thank you

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References


