Unsuspected Post-Concussive Symptoms (PCS) in Children Requiring Cervical Spine Clearance

Becky Cook, DNP, CNP, RN
Kaaren Shebesta MSN, CNP, RN
Mary Ellen Watts, BSN, RN
Erin Butt, MSN, CNP, RN
Suzanne Moody, MPA, CCRP
Richard A. Falcone, Jr, MD, MPH

Cincinnati Children’s Hospital Medical Center
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Objectives

• Discuss high rate of PCS in children requiring c-spine clearance and role of symptom assessment (SA).

• Emphasize importance of providing anticipatory guidance about PCS to patients released in cervical collars.
Background

• Whiplash & concussion often coincide
• PCS:
  – Prolonged recovery: ADLs, school, sports
  – Increased risk of secondary injuries
• Barriers:
  – Young children unable to describe PCS
  – Older children feel invulnerable
  – Concussion
    • Minimized due to primary injury
    • Not appreciated
Symptom Assessment (SA)

• Valuable:
  – Document PCS
  – Timely referral to specialty services
  – Monitor symptom resolution
  – Support care interventions
  – Support patient / family education & reassurance
  – Discharge education significantly reduces:
    • Symptom reporting
    • Behavioral changes
SA score:

- 22 symptoms
- Scale: 0 – 6
- Score range: 0 - 132
- Normal score:
  - Boys: 0 - 6
  - Girls: 0 - 8
- Abnormal score referral:
  - Sports Medicine
  - Neurology
  - Pediatric Rehab

Adapted from: Lovell, et al, 1998
Unsuspected PCS

• Purpose: Determine the incidence of PCS in children seen for c-spine clearance

• Methods:
  – Incorporated symptom assessment (SA)
  – Retrospective chart review
  – Patients seen in NP Trauma Clinic for c-spine clearance (June 2012 – June 2013)
    • Emergency Department
    • Inpatients
Patient Demographics

- **N = 244**
  - Age: 5 – 17 yrs
    - 5 yr: 11 (4%)
    - 6 – 9 yrs: 28 (12%)
    - > 10 yrs: 205 (84%)
  - Gender:
    - Male: 124 (51%)
    - Female: 120 (49%)
  - Documented SA: 179 (74%)
    - SA Range: 0 – 95
    - Mean: 17.4

Mechanism of Injury
Abnormal SA Score

- **N = 98 (55%)**
- **Age: 5 – 17 yrs**
  - 5 yr: 1 (1%)
  - 6 – 9 yrs: 10 (10%)
  - ≥ 10 yrs: 87 (89%)
- **Gender:**
  - Male: 36 (37%)
  - Female: 62 (63%)
- **SA Range: 7 – 95**
- **Mean:** 31
Abnormal SA Score

Mechanism of Injury

- Sport: 28.6%
- MVC: 24.4%
- Falls: 19.4%
- Other: 27.6%
Unsuspected PCS

N = 179

52 (29%)
Concussion Dx

39 (75%)
Abnormal SAS

13 (25%)
Normal SAS

127 (71%)
No concussion Dx

59 (46%)
Abnormal SAS

68 (54%)
Normal SAS
Referral to Head Injury Clinic

• N = 98
  – 83 (85.6%) follow up
    • Pediatric Rehab
    • Sports Medicine
    • Neurology
  – Mean of 2.1 visits
    1-6 visits total
Implications

• Careful screening identified a high rate of unsuspected PCS in children requiring c-spine clearance
• Formal assessment of PCS incorporated into the evaluation
• Anticipatory education regarding PCS when released from ED/inpatient setting in a cervical collar
Unsuspected PCS

• Limitations
  – Retrospective review over a 1 year time period
  – No data for children < 5 years
  – Did not distinguish ED vs inpatient outcomes

• Next steps:
  – Inpatient SA screening prior to discharge (done)
  – Collaboration with ED: Incorporating concussion education
  – Prospective evaluation
  – Screening tool for young children
References

References