

Pediatric Emergency Medicine Conference
October 12, 2012

Oneica Poole
PGY1

- Previously healthy 4yo girl presents to the ED with bilateral upper and lower extremity weakness that started about 1hr PTA. Her parents report that she had fallen from a trampoline unto the ground yesterday morning (~23hrs prior to presentation). They did not seek medical attention sooner, as she “seemed just fine until about an hour ago when we noticed she was having trouble walking.” The fall was witnessed by patient's parents, who denied head injury; seizure; bleeding or fluid drainage from ears, nose or throat; loss of consciousness; or vomiting. They also denied fevers or recent illness.

Physical exam was remarkable for bilateral UE and LE hypotonia, with +2/5 strength and hyporeflexia. Neurologic exam was otherwise wnl as was the rest of the physical exam. X-ray and then CT of spine were obtained, and both were normal. Given the h/o trauma and clinical presentation, a diagnosis of SCIWORA is entertained. Which of the following studies would be the best diagnostic study to this time?

- a. SSEPs (Somatosensory Evoked Potentials)
- b. MRI of spine
- c. Angiography
- d. CT Myelography

Neurological exam was remarkable for hypotonic bilateral upper and lower extremities, with +1/5 strength and hyporeflexia. Neurologic exam was otherwise wnl as was the rest of the physical exam. Spine was immobilized. Both X-ray and CT of spine were normal. Given h/o trauma and clinical findings, a dx of SCIWORA is entertained. 1. Which of the following is the best next step in confirming diagnosis?

a. SSEPs (Somatosensory Evoked Potentials)

b. MRI of spine

c. Angiography

d. CT Myelography

SCIWORA Syndrome

(Spinal Cord Injury without Radiographic Abnormalities)

- Defined as occurrence of traumatic spinal cord injury despite normal plain radiographs and CT studies.
- However, most cases have demonstrable injury of the spinal cord, spinal ligaments, or vertebral body end plate on magnetic resonance imaging (MRI)

Explanation

- **b. MRI of spine--** MRI is preferred to CT myelography (choice d) for acute assessment of traumatic spinal cord injury, because it is noninvasive, delineates spinal cord and soft tissue abnormalities, and can assess compressive pathology. In the event MRI is unavailable, and acute assessment is indicated then, CT myelography should be performed.
- **(Choice a)** SSEPs—used to test neurologic function and may be obtained within 24 hrs of admission and compared in follow up analysis to assess progress of pt with SCIWORA. However it is not used diagnostically.
- **(Choice c)** angiography—not recommended in diagnosis of SCIWORA

2. MRI was obtained, and it showed ligamentous and spinal cord injury at the C4/C5 level. What is the most appropriate course of management?

- a. Administer high dose methylprednisolone bolus of 30mg/kg iv once
- b. Administer methylprednisolone bolus of 30 mg/Kg iv, followed by infusion at 5.4 mg/Kg/hr for the next 23 to 48 hrs
- c. Immobilization of cervical spine with hard collar or rigid brace until neurological deficits have resolved
- d. Administer high dose methylprednisolone IV, and continue cervical spine immobilization until neurological deficits have resolved

MRI was obtained, and showed ligamentous and spinal cord injury at the C4/C5 level. What is the most appropriate course of management?

- a. Administer high dose methylprednisolone bolus of 30mg/kg iv once
- b. Administer methylprednisolone bolus of 30 mg/Kg iv, followed by infusion at 5.4 mg/Kg/hr for the next 23 to 48 hrs
- **c. Immobilization of cervical spine with hard collar or rigid brace until neurological deficit have resolved**
- d. Administer high dose methylprednisolone IV and cervical spine immobilization until neurological deficit has resolved

Explanation

- ~ 25% of children with SCIWORA may experience delayed onset of neurologic signs which can range from complete paralysis to partial neurologic deficits. The latent period may range from 30 minutes to four days after trauma.
- Methylprednisolone bolus of 30 mg/Kg iv **within 8 hrs of injury**, followed by infusion at 5.4 mg/Kg/hr for the next 23 to 48 hrs is beneficial in improving the outcome. However, the patient in this case is presenting almost 24hrs after the injury occurred. Giving high dose steroids at this stage has not been shown to be beneficial, and is thus not indicated (**choices a, b, and d**).

- Currently there is insufficient evidence to support treatment standards, but recommendations include immobilization of involved spinal segment for 12 weeks or until neurologic deficit has resolved (**choice c**).

References

- http://orthopedicsurgeons.blogspot.com/2010_01_03_archive.html
- http://www.medscape.com/viewarticle/527718_4
- www.uptodate.com
- Veena Kalra, Sheffali Gulati, Mahesh Kamate & Ajay Garg. (2006). SCIWORA–Spinal Cord Injury Without Radiological Abnormality. *Indian Journal of Pediatrics*. 73(9):829–31

THANK YOU!