PAEDIATRIC SPINAL INJURY AND SCIWORA

INTRODUCTION

Paediatric spinal injuries are uncommon. They are usually secondary to motor vehicle accidents and to a lesser extent falls and sporting injuries. As in adults they are commonly associated with concurrent head injuries. Spinal cord injury is very uncommon with the incidence of spinal cord injury in spine-injured children is 1%.\(^1\)

ANATOMICAL CONSIDERATIONS OF THE PAEDIATRIC SPINE\(^2\)

- Relative ligamentous laxity
- Shallow (relatively vertical) angulation of facet joints
- Immature development of neck musculature
- Incomplete ossification of vertebrae
- Disproportionately large head

Subsequently 60-80% of all paediatric spinal injuries are in the cervical region, particularly the upper cervical spine – with 80% occurring at C1-3 in children <8 yo.

The fulcrum of neck movement is at C2-3 in the infant, C3-4 at 6 yo and C5-6 at 8yo.

After 8 yo the injury pattern is similar to adults.

SCIWORA (Spinal Cord Injury Without Radiographic Abnormality)

SCIWORA refers to objective signs of spinal cord injury following trauma without any evidence of fracture or ligamentous injury on radiological imaging.

The phenomena was first reported in 1982 by Pang & Wilberger\(^3\) who also noted that delayed presentations with paralysis were occurring up to 4 days following injury. Its incidence has been reported between 1-10% of all spinal cord injuries in children.\(^1\) It is more common in children < 8yo with cervical spine injuries. The hypothesis behind the aetiology of SCIWORA is that of ligamentous laxity and bony immaturity allowing the transfer of forces through to the spinal cord resulting in myopathy without bony injury.

In modern times, SCIWORA has become a misnomer as most of these patients actually have a radiological abnormality on MRI. True SCIWORA is now exceedingly rare.\(^2\)

SPINAL IMMOBILISATION

Spinal immobilisation can be particularly difficult in smaller children and infants. Traditionally immobilisation has been performed with a rigid cervical collar and fixation to a spinal board with a head immobiliser and strapping. However this can lead to discomfort, distress, pressure areas and in some cases can worsen the initial injury with elevated ICP, the potential for airway obstruction and ventilatory compromise.\(^1\) Spinal boards need to be modified in children under 8 yo to prevent neck flexion with either an occipital recess or mattress padding.
A balance must be made between diminishing any secondary spinal injury and interfering with assessment and comfort of the child. Parents and carers should be encouraged to help in the process where feasible. Time kept on the spinal board must be limited to the shortest time possible.

REFERENCES