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FROM ABSTRACT

Study Design.
Retrospective case review.

Objective.
This study aims to characterize a broad spectrum of spinal injuries, from minor soft tissue injuries to spinal cord injuries.

Summary of Background Data.
While pediatric spinal trauma is generally considered to be rare, the impact of serious spinal trauma is considerable, both in medical and socioeconomic terms.

Comparison of serious and minor injuries has rarely been carried out for pediatric spinal injury cases.

Methods.
All children up to age 16 who sustained spinal trauma, as defined by ICD10 codes, at 2 pediatric trauma hospitals in Sydney, Australia were identified (N = 340). Data on injury mechanism (defined as the causative event), type, and spinal level were collected and analyzed using logistic regression.

Results.
Traffic-related incidents accounted for approximately one third of all spinal trauma and half of serious injuries.

The cervical spine was the most frequently injured region, with thoracic and lumbar spine injuries becoming more common with age.

The upper cervical spine was more commonly seriously injured in young children, and the lower cervical spine was involved more often in older children.

The frequency of minor soft tissue neck injuries increased substantially above the age of 8.

Serious spinal injury is more likely to occur in conjunction with multiple trauma.

Road traffic incidents were more likely to result in serious spinal injury than falls or sporting incidents.
Conclusion.
This study has shown that the pattern of spinal injury in children is related to age and the mechanism of injury.

While traffic-related incidents are a leading cause of injury across all age groups, emphasis on fall prevention is needed for younger children.

Older children, particularly boys, are sustaining spinal trauma in sporting and recreational activities.

THESE AUTHORS ALSO NOTE:

  Spinal trauma in children encompasses a variety of injury types to a variety of anatomic structures.

  “The incidence of traumatic spinal injury increases with age” and road traffic incidents are the leading cause of serious spinal injuries.

  This study was a retrospective records review of all children aged 16 years or younger who were treated at one of two children’s hospitals, covering all types and severity of injuries to the spine and surrounding soft tissues. “This included spinal cord injuries, vertebral fractures, subluxations [medical] or dislocations, ligamentous injuries to the spinal column, as well as minor soft tissue injuries.”

  Spinal injuries were classified as serious if a fracture, spinal cord injury, vertebral subluxation/dislocation, or major ligamentous injury was present.

  Minor injuries included small external lacerations, abrasions and contusions, minor transient neurologic symptoms, such as tingling in the extremities (when serious neural injury was ruled out), muscle strains, and pain with no other findings.

  “The total number of cases included in this study was 340, with 103 of these being considered serious injuries (30%).”

  “The largest numbers of children with spinal injuries were in the 9- to 12-year age group, but for serious injuries, there were more children in the 13- to 16-year age group.”

  “The 0- to 4-year age group had the highest proportion of serious injuries (47%), and the 9- to 12-year age group had the lowest proportion of serious injuries (19%).”

  “Children 8 years old and younger were twice as likely to sustain a serious spinal injury rather than a minor spinal injury compared with children 9 to 16 years of age.
“Traffic-related incidents were the most frequent cause of spinal injuries, irrespective of injury severity. Falls and sport were the next most common injury causes.”

“The cervical spine was the most commonly injured region.”

“Cervical injuries (of all severities) were significantly more common than other injury levels for children 8 years of age and younger.”

“When only the serious injuries were examined, cervical injuries still account for the majority of injuries.”

Children aged 8 and under are more likely to sustain a cervical spine injury.

“Upper cervical spine injuries dominate the children up until age 8, after which lower cervical spine injury frequency increases, exceeding the upper cervical spine in the 13- to 16-year age group.”

“Approximately two thirds of the injuries were minor cuts, bruises, and strains.”

“Overall, spinal cord injury was present in 5.6% of cases.”

Fractures without spinal cord injury made up 17% and ligamentous injuries 7%.

Minor injuries were more common in 9- to 12-year-olds and less common in children younger than 5 years.

“This study has identified increased numbers of minor soft tissue injuries in 9- to 12-year-olds, and the dominance of sport-related injuries, particular minor injuries, in boys 9 years of age or older.”

“While previous studies have also seen decreases in cervical spinal injuries with age, this study indicates that the proportionate decrease in cervical injuries in children 9 years of age or older is accompanied by an increase in both thoracic and lumbar injuries, perhaps reflecting changes in spine biomechanics with development and/or exposure to different injury mechanisms.”

“Traffic-related injuries are the most common cause of spinal injury.” “This is thought to be due to the magnitude of the forces that are associated with traffic crashes.” [Important]

“There was an increase in minor spinal injuries in the 9- to 12-year age group, most of which were soft tissue neck injuries.”
There were more minor neck injuries in the 9- to 12-year age reported in motor vehicle occupants. Almost all of these cases involved children sitting in the front seat, indicating the transition to adult cervical spine injury mechanisms, “including a small number of whiplash-type injuries in rear impacts.”

“The 13- to 16-year age group shows an increase in serious injuries associated with sporting and diving activities.”

“In the youngest children, cervical injuries dominated, with lumbar and thoracic injuries increasing with age. This may reflect the reported differences in biomechanical properties of the spine as well as differences in exposure and injury mechanism.”

This study found that “in children under 9, serious cervical spine injuries tend to be in the upper cervical spine (at or above C3), with the lower cervical spine becoming more frequently involved with increasing age.”

“Diving is associated with lower cervical spine rather than upper cervical spine injuries in children.”

“Children who sustain minor injuries and are not brought to hospital, but rather see a general practitioner or other health-care professional are not included in the sample.” Therefore, this “data under-represents minor injuries.”

KEY POINTS FROM AUTHORS:

1) “The most common cause of serious pediatric spinal trauma is motor traffic incidents.”

2) “Minor neck injuries become more common in children after age 8”.

3) “Sporting activities, largely rugby football, are a common cause of neck injury in older boys.”

4) “Spinal injuries from falls are most common in children 8 years of age and younger.”

KEY POINTS FROM DAN MURPHY

1) This study looked at spinal trauma in children up to age 16 at 2 pediatric trauma hospitals.

2) “Traffic-related incidents accounted for approximately one third of all spinal trauma and half of serious injuries.”

3) “The cervical spine was the most frequently injured region, with thoracic and lumbar spine injuries becoming more common with age.”
4) “The upper cervical spine was more commonly seriously injured in young children, and the lower cervical spine was involved more often in older children.”

5) “The frequency of minor soft tissue neck injuries increased substantially above the age of 8.”

6) “Road traffic incidents were more likely to result in serious spinal injury than falls or sporting incidents.”

7) Traffic-related incidents are a leading cause of spinal injury across all age groups.

8) “Older children, particularly boys, are sustaining spinal trauma in sporting and recreational activities.”

9) Of the total number of spinal injury cases found in this study, 30% were classified as serious and 70% were classified as minor.

10) “The largest numbers of children with spinal injuries were in the 9- to 12-year age group”

11) For serious spinal injuries, the largest group was children in the 13- to 16-year old age.

12) The 0- to 4-year age group had the highest proportion of serious injuries, at 47% of the group.

13) “Traffic-related incidents were the most frequent cause of spinal injuries, irrespective of injury severity.”

14) “The cervical spine was the most commonly injured region.”

15) “Upper cervical spine injuries dominate the children up until age 8, after which lower cervical spine injury frequency increases, exceeding the upper cervical spine in the 13- to 16-year age group.”

16) “Traffic-related injuries are the most common cause of spinal injury.” “This is thought to be due to the magnitude of the forces that are associated with traffic crashes.” [Important]

17) There were more minor neck injuries in the 9- to 12-year age reported in motor vehicle occupants. Almost all of these cases involved children sitting in the front seat, indicating the transition to adult cervical spine injury mechanisms, “including a small number of whiplash-type injuries in rear impacts.”
18) This study found that “in children under 9, serious cervical spine injuries tend to be in the upper cervical spine (at or above C3), with the lower cervical spine becoming more frequently involved with increasing age.”

19) “Children who sustain minor injuries and are not brought to hospital, but rather see a general practitioner or other health-care professional are not included in the sample.” Therefore, this “data under-represents minor injuries.”

COMMENTS FROM DAN MURPHY

This article clearly documents that children are injured in automobile accidents, in sports activities, and through other mechanisms. This clearly establishes a rationale for why these children may require chiropractic to treat these injuries.