Prevention: The Cure For Child Head Injuries

KKH-NUHS study finds non-compliance with safety measures to be significant among children with head injuries.

By Isadora Ong

A paediatric trauma surveillance study[1] jointly conducted by KK Women's and Children's Hospital (KKH) and National University Health System (NUHS) has revealed that, from January 2011 to March 2015, vehicle and bicycle incidents were a leading cause of severe paediatric head injuries resulting in death, neurological and physical deficits or poor quality of life.

Led by Dr Chong Shu-Ling, Staff Physician, Department of Emergency Medicine, KKH, researchers surveyed data from 1,049 children under 16 years presenting with head injuries at the hospitals' emergency departments who required a computed tomography scan, admission for monitoring of persistent symptoms, or who subsequently died from the head injury.

VEHICLE, BIKE INCIDENTS LINKED TO MOST SEVERE OUTCOMES

While vehicle and bicycle incidents accounted for a comparatively small percentage of the presenting cases (11.7%), they were associated with severe outcomes such as death, the need for invasive ventilation or neurosurgical intervention – making them the most dangerous mechanisms of head injury.

The main culprit was noncompliance with road safety laws. "Despite stringent regulations governing road safety in Singapore, best practices for vehicle, bicycle or motorcycle child passenger safety had not been observed for the majority of this group of head-injured children," Dr Chong says.

Forty-five percent of the children involved were vehicle or bicycle passengers, three quarters of whom were not using child car restraints or helmets. Young children are reliant on their caregivers to ensure that they are provided age-appropriate safety measures on the road.

Fifty-five percent were pedestrians – this group of road users is known to be at high risk of severe injuries compared to other road users; in particular older children who may not be supervised when crossing the road. "Due to their small body frame, child pedestrians are at increased risk of getting into a road incident – as they are less visible to motorists than adults. When involved in a collision, they are also more likely to sustain severe and multiple injuries.

"Lives can be saved and poor outcomes pre-empted through simple preventative behaviours such as compliance with road safety laws and proper supervision," Dr Chong emphasises.

She reiterates that children below 12 years should never be placed in the front seat of a vehicle; instead they should ride in the rear seat with age-appropriate restraints. Child cyclists must use helmets at all times.

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Dr Chong Shu-Ling
Staff Physician,
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FALLS IN THE HOME

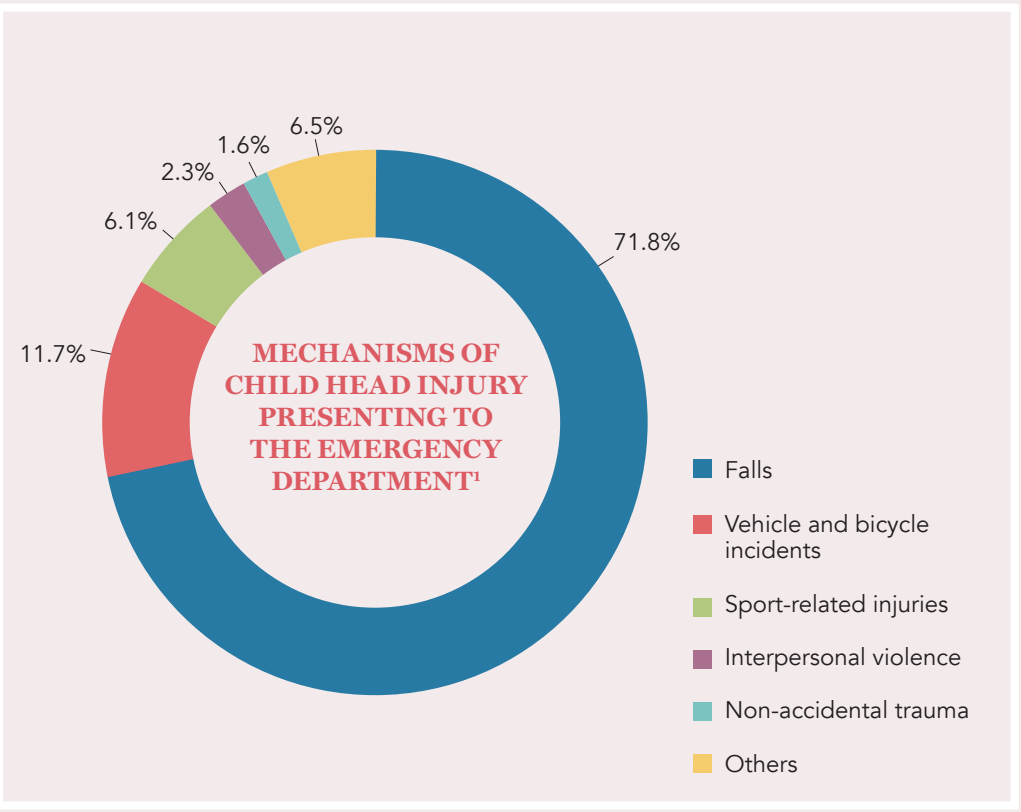
In the study, falls accounted for 71.8 percent of children presenting with head injuries, with more than half of the incidences occurring in the home. Most of these incidences involved furniture such as the adult bed and sofa. While the injuries were of lower severity, the likelihood of a severe outcome increased by 1.4 times with every metre increase in the height of a fall.

Further, while children under the age of two comprised only 25 percent of those presenting with head injuries, 84.7 percent of this age group sustained their injuries from falls.

"Children under two years typically have a relatively large head in comparison to the rest of their body. This can predispose toddlers to falls and head injuries while engaging in daily activities such as jumping during playtime or climbing the stairs," explains Dr Chong.

"Heightened supervision is recommended for this age group, as children are particularly vulnerable to head injuries during the crucial years of rapid brain growth and neurocognitive development."

Other causes of paediatric head injuries noted in the study included contact with objects; sports-related injuries; interpersonal violence and non-accidental trauma.



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In seeking to prevent paediatric head injuries, Dr Chong recommends increased safety awareness during physical activities such as sport, with injuries promptly attended to and unresolved symptoms referred for medical assessment.

Activities associated with a higher risk of severe head injury – such as contact sports, ball games and gymnastics – should be closely supervised with safety measures and precautions strictly adhered to.

CULTIVATING A CULTURE OF SAFETY

The severely head-injured child faces the potential of life-long disability and loss in quality of life in the long term, or even death, with emotional, financial and social ripple effects spreading to the family and society.

In addition to providing timely diagnosis and intervention for children with head injuries, Dr Chong applauds community healthcare practitioners for the vital and valuable role they play in educating the child and their caregivers on future injury prevention strategies.

"There is a valuable opportunity for education at the point of treatment for a minor head injury, as both the caregiver and child are at heightened awareness of the need to prevent future, more severe, head injuries," says Dr Chong.

"Community healthcare practitioners are also well placed to meet the need for robust childhood injury surveillance in the community and to assist patients and families in accessing health and social support services as appropriate.

Working in concert, necessary action by caregivers, as well as healthcare providers, will go a long way towards reducing the incidence of child injuries and fatalities in our population."

References:

1. *Chong, S, Chew SY, Feng JXY, et al. A prospective surveillance of paediatric head injuries in Singapore: a dual-centre study. BMJ Open 2016; 6: e010618. doi:10.1136/bmjopen-2015-010618*

AT A GLANCE: PAEDIATRIC HEAD INJURIES IN SINGAPORE
(JANUARY 2011- MARCH 2015)

BOYS

63%

GIRLS

37%

Road injuries constitute high risk for death, neurological and physical deficits or poor quality of life.

71.8%
caused by falls

41%
took place in the home

54.5%
of those with road injuries were pedestrians

45.5%
of those with road injuries were passengers or cyclists

1.4 times
The increase in likelihood of sustaining a severe head injury with every metre increase in the height of a fall

MANAGEMENT RECOMMENDATIONS FOR CHILD HEAD INJURIES

Open wounds
A patient with an open wound should be attended to immediately, and a neurological examination performed to determine the extent and severity of the head injury.

History taking
Information gathering from the child and caregiver is also vital to understand the history surrounding the circumstances of the injury and the child's symptoms.

Children under two years
Special care should be taken when assessing children under two years with head injuries, as preverbal children may have difficulty clearly communicating the symptoms of their injury, potentially increasing the likelihood of under-reporting or the delayed discovery of injuries.

If intracranial injury is suspected
If there is suspicion of an intracranial injury, the patient should be promptly referred to a tertiary centre.

Moderate to severe intracranial head injuries can result in swelling and blood clots in the brain (haematoma); neurosurgical intervention may be required – such as the evacuation of haematoma or intracranial monitoring – to reduce the risk of mental impairment, physical disability, or fatality.

Head injury symptoms requiring prompt referral for tertiary assessment
- Altered mental status or reduced consciousness
- Abnormal neurological examination (e.g. unsteady gait)
- Unusual behaviour (e.g. persistent crying or irritability) among younger children
- Persistent headache or vomiting among older children