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Diagnosing Head Injuries in Children

A large-scale, multicenter validation study was conducted to assess the diagnostic accuracy of three clinical decision rules used by emergency doctors. The objective was to determine if it was possible to reduce unnecessary CT scans and radiation exposure in children with head injuries. The outcomes from the trial are published in The Lancet.

See Also: Balancing Radiation Doses

Head injuries are among the most common reasons why children are taken to emergency departments. A large percentage of these children undergo a CT scan so that physicians can rule out a serious brain injury.

The results from the Australasian clinical trial are expected to help inform the use of the clincial decision rules for head injuries. This could in turn help minimise CT scans, explains lead investigator, Murdoch Children's Research Institute's Associate Professor Franz Babl.

Prof. Babl highlights the fact that most head injuries are mild and do not typically require neurosurgical management. Only a small proportion of patients have clinically significant intracranial injuries. It is thus important for physicians to diagnose an injury with as little radiation exposure as possible.

"The preferred course of treatment is to avoid a CT scan in minor head injuries if it is unnecessary. In particular, there is concern about the high radiation dose associated with CT scans of the head which can lead to cancer."

Clinicians can turn to three clinical decision rules that have been developed to more effectively identify children who are at high risk of intracranial injuries as well as assist clinicians to minimise CT scans while identifying these injuries.

This trial which runs across 10 Australian and New Zealand tertiary hospitals involves 20,137 children under the age of 18 with head injuries. The three rules that were compared include:

- The Pediatric Emergency Care Applied Research Network (PECARN, USA)
- The Canadian Assessment of Tomography for Childhood Head Injury (CATCH) rule
- The Children's Head Injury Algorithm for the Prediction of Important Clinical Events (CHALICE, UK).

The researchers wanted to determine which of these three decision rules provided the best option when identifying children at very low risk of a traumatic brain injury. The analysis revealed that all three rules were good but the PECARN from the US did not miss a single patient requiring neurosurgery.

This could thus be a good starting point for both individual clinicians and hospitals that may be contemplating modifiying one of these rules. The next step now is to develop national approaches that will optimise the management of children with head injuries in Australia and New Zealand.

Prof. Babl cautions that it is important to relate these findings to other factors such as the baseline CT use, the effect of the rules on the projected CT rate, the baseline clinician diagnostic accuracy and experience, parental expectations, the medico-legal climate and economic considerations.

Source: Emergency Medicine Foundation Australia
Image Credit: Pixabay

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