



Audit of Appropriateness of Imaging in Paediatric Head Trauma

Ashley Pardoe, Year 3 GEMS, University of Limerick

Dr. Damien Ryan MRCSI, MRCSEd(A&E), DIMC, FCEM

**Consultant in Emergency Medicine, and Director, Centre for Prehospital Research
Emergency Department, University Hospital Limerick, Dooradoyle, Limerick**

A Few Considerations...

- **Traumatic Brain injury is a leading cause of death and disability in children**
- **In the United States, childhood head trauma results in (annually) ¹:**
 - **3,000 deaths**
 - **50,000 hospitalizations**
 - **650,000 Emergency Department (ED) visits**
- **Children who present with apparently minor head injury, make up 50% of children with documented TBIs¹.**
- **Lifetime cancer mortality risk attributed to radiation from a CT in a paediatric patient are estimated to be significantly higher higher than adults**

1. Kuppermann, N. 2008. 'Pediatric head trauma: the evidence regarding indications for emergent neuroimaging' *Pediatric Radiology* 38 (Suppl 4), available: <http://link.springer.com>

What were we looking for??

We reviewed the Emergency Department (ED) records of paediatric patients (<16 yrs) presenting with head injury (n=100):

- 1. To establish whether NICE guidelines are being adhered to with respect to CT scanning in children who present to the ED with head injury.**
- 1. To establish if those paediatric patients with head injury who meet NICE criteria for CT, but who are not investigated with CT, are being admitted for observation**

Methods

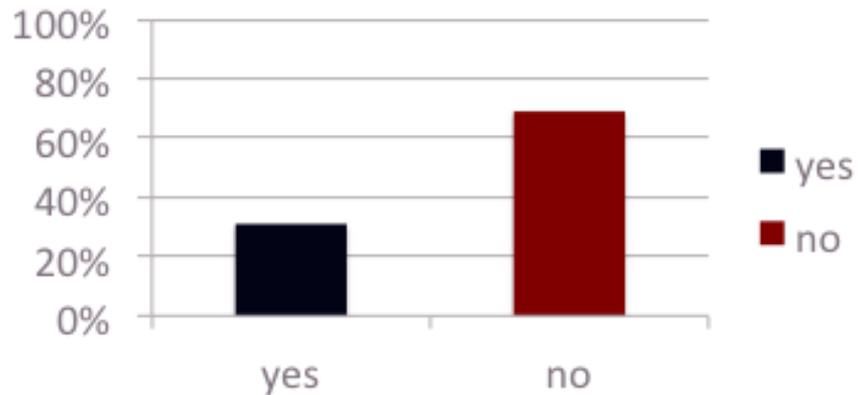
- **This retrospective audit evaluated the charts of paediatric patients (<16 years old) who presented to the Emergency Department of the MWRH, Limerick with head injury (n=100).**
- **Emergency Department records were evaluated for the presence of recorded risk factors, and for details with respect to imaging request**
- **Data was analyzed using SPSS and Excel software programs.**

Criteria according to NICE Guidelines

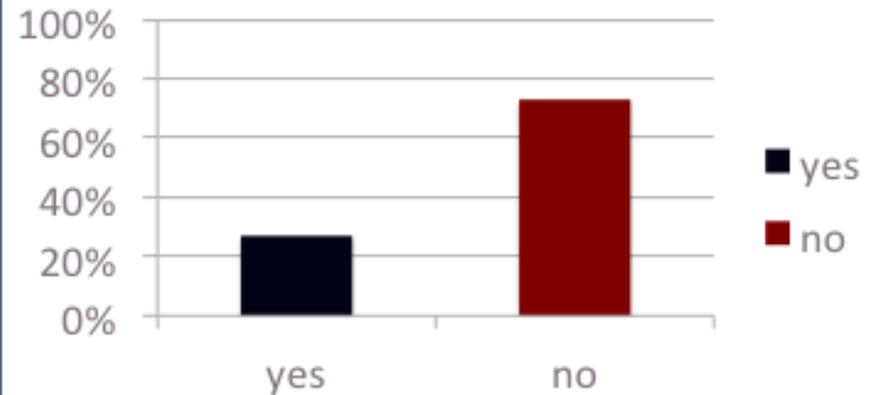
- Loss of consciousness lasting more than 5 minutes (witnessed)
- Amnesia (anterograde or retrograde) lasting more than 5 minutes
- Abnormal drowsiness
- Three or more discrete episodes of vomiting
- Clinical suspicion of non-accidental injury
- Post-traumatic seizure, but no history of epilepsy
- GCS < 14, or GCS <15 (pediatric) for a baby under a year, on assessment in the ED
- Suspicion of open or depressed skull injury or tense fontanelle
- Any sign of basal skull fracture (haemotympanum, 'panda' eyes, CSF leakage from the ear or nose, Battle's sign)
- Focal neurological deficit
- If under 1 yr, presence of bruise, swelling or laceration of more than 5 cm on the head
- Dangerous mechanism of injury (high-speed road traffic accident (as a pedestrian, cyclist or vehicle occupant), fall from a height >3m, high-speed injury from a projectile or an object)

Results

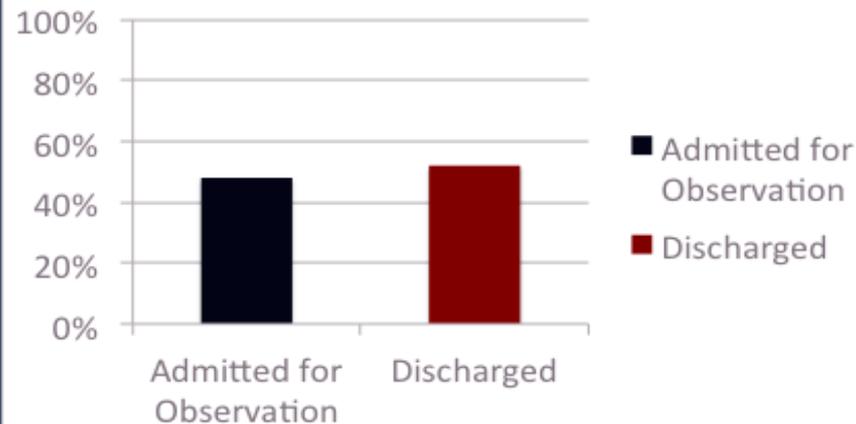
Patients who required CT according to NICE Guidelines



Was CT Performed in those indicated?



Patients who did not have CT, but had risk factors



Conclusions

- **NICE guidelines are excessively liberal**
- **A need for risk stratification**
- **GCS scores should be recorded in all cases, rather than merely subjective observations of wellness**
- **More research necessary to elucidate how criteria should be weighted to generate a guideline which balances the risks and benefits associated with CT in paediatric patients**



Thank you!