

Improving the Diagnosis of Abusive Abdominal Trauma

Reid Fisher¹, Boaz Karmazyn², Megan Marine²

¹Indiana University School of Medicine, ² Indiana University School of Medicine, Department of Radiological and Imaging Sciences

Background/Objective: Abusive abdominal trauma (AAT) in children when missed can be fatal. In addition, differentiating from accidental trauma is essential in evaluating for other injuries and protecting from continued inflicted injuries. Abdominal CT remains the gold standard study to evaluate for abdominal injuries. Our purpose is to identify findings in presentation, clinical evaluation, the abdominal CT, and other imaging that can improve the diagnosis of abusive abdominal trauma.

Methods: A retrospective (2011-2020) study compared children younger than 3 years that had abdominal CT scans for abusive trauma to those with accidental blunt abdominal trauma. Demographic information, clinical presentation, physical exam findings, final diagnoses, lab values, and imaging studies were collected. Descriptive analysis and Fisher's exact test were used to determine significance of findings.

Results: 226 (125 male, average age 11 months) patients had AAT and 90 (48 male, average age 18 months) patients had accidental trauma. 30 patients in the abusive group and 19 patients in the accidental group had positive CT. Most (70%) children with AAT and positive CT had no explanation for the trauma. Fall injury was reported in 27% of abusive (88.9% younger than 1 year) and 32% (83.3% older than 1 year) of accidental trauma. Retinal hemorrhage, abdominal bruising, subdural hematoma, and rib fractures were significantly ($p < 0.05$) more common in the abusive group. In addition, 13 (43%) of patients with AAT and positive CT had rib fractures while none were detected on CT in the accidental group.

Conclusions: In children younger than 3 years with abdominal trauma that present with a history of a fall or unknown injury, abusive abdominal trauma should be suspected. These children should subsequently be evaluated for other injuries. Children should be evaluated for nonaccidental trauma if rib fractures are visualized on abdominal CT, as these were only seen in AAT.