

Retinal Exams in Abused Children With Normal Neuroimaging

Source: Greiner MV, Berger RP, Thackeray JD, et al. *Dedicated retinal examination in children evaluated for physical abuse without radiographically identified traumatic brain injury. J Pediatr.* 2013;163(2):527-531; doi:10.1016/j.jpeds.2013.01.063

Researchers from the multi-institutional Examining Siblings to Recognize Abuse (ExSTRA) research network sought to determine the prevalence of retinal hemorrhages (RH) in children <10 years of age who were being evaluated because of concerns for physical abuse and did not have evidence of traumatic brain injury (TBI). Additionally, the researchers aimed to evaluate the associations of RH in children who had no evidence of TBI, but who had abnormal mental status, facial bruising, and complex or occipital skull fracture. For the study, data collected at 20 participating US centers on all children <10 years of age who underwent subspecialty consultation for physical abuse between January 15, 2010 and April 30, 2011 were reviewed. TBI was defined as any radiological evidence of intracranial trauma, including subdural, subarachnoid, or epidural hemorrhages, brain contusions, and/or brain edema. The following information about RH was collected: presence, number, distribution, number of layers involved, and presence or absence of retinoschisis (splitting of the layers of the retina). RH that were numerous, multilayered, and extended to the periphery of the retina were considered to be “characteristic” for abuse.

Of the 1,122 eligible patients without TBI, 352 (32%) had dedicated examinations for RH, including 198 with complex or occipital skull fracture, altered mental status, or facial bruising. The median age of the 352 study children was 8.5 months (range 2-92 months). Among the 352 children, only 2 (0.6%; 95% CI, 0.1-2.0) had any RH identified. Neither child had “characteristic” RH that were thought to be “forensically significant” or retinoschisis. The authors calculate that it would require approximately 176 dedicated retinal examinations to detect 1 child with RH in this population, and that the RH detected would not likely be forensically significant.

The authors conclude that children being evaluated for physical abuse without TBI on neuroimaging may not require dedicated retinal examinations.

Commentary by

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Dr Anderst has disclosed no financial relationship relevant to this commentary. This commentary does not contain a discussion of an unapproved/investigative use of a commercial product/device.

This study adds to the existing literature suggesting that RH, particularly forensically significant RH, are exceedingly rare in children with essentially normal neuroimaging and an examination for such is generally not indicated in this population.^{1,2} This research is the first multi-institutional, prospectively planned study to collect and analyze these types of data.

One previous case series identified 9 children with altered mental

status in whom there was RH despite a normal initial head CT. However, that study included some children who had abnormalities on subsequent head imaging. Additionally, the cases were accrued via an international list serve, creating a potential selection bias.

A weakness of the current study is a lack of information on when the dedicated retinal examinations were done and who did them. In addition, the decision to obtain head imaging and/or dedicated examination for RH was left to the individual centers, potentially introducing selection bias. Nonetheless, this large series, taken in context with previous work, solidifies the notion that dedicated retinal examinations are usually not necessary in young children who may have been abused, but have normal neuroimaging studies.

References

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3. Morad Y, et al. *J Pediatr.* 2003;142(4):431-434; doi:10.1016/j.jaapos.2004.06.007

Key words: retinal hemorrhage, child abuse

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Question: Among children <10 years of age evaluated for physical abuse without traumatic brain injury, what is the rate of retinal hemorrhages?

Question type: Descriptive/Occurrence

Study design: Cross-sectional

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