

# Highlighting Violent and Repetitive Shaking

Recent court decisions in the United States, Canada, and the United Kingdom have demonstrated confusion and uncertainty by the triers of fact, whether they be judges or juries, about the evidence presented in cases of alleged abusive head trauma. It is not surprising that judges and juries have a difficult time understanding and evaluating the evidence presented by the opposing sides of these courtroom arguments. Complicated scientific discourse by “dueling experts” who offer diametrically opposite views of the medical issues at hand cloud the issues even more. Efforts to define the admissibility of expert testimony by the courts have taken place. One such effort is the Daubert hearing,<sup>1</sup> wherein the court attempts to determine if a theory that is being presented is generally accepted, whether it can be tested, and whether the theory depends on peer-reviewed publications, among other things. However, the Daubert hearing allows for wide interpretation by the courts, and it has limited usefulness in excluding those who would give irresponsible medical testimony.

One of the medicolegal arguments in cases of abusive head trauma has been whether shaking an infant, in the absence of an impact, creates sufficient forces to produce all the classic injuries associated with abusive head trauma. Medical witnesses for the defense claim that there is no such evidence. The inherent difficulty in studying this phenomenon via animal, computer, or doll models has hampered efforts to settle this issue, because none of these models even approximates the characteristics of the scalp, skull, membranes, blood vessels, or brains of the human infant or small child. For obvious reasons, abusive head trauma cannot be studied in living children, so the answer to this question must come from other sources. Because abuse is almost always unwitnessed, the only firsthand evidence of what happened, when it happened, and what the effects were on the infant comes from the perpetrator.

In this issue of *Pediatrics*, Adamsbaum et al<sup>2</sup> bring new insight to perpetrator confessions in cases of abusive head trauma. They studied well-documented cases of abusive head trauma over a 7-year period by using clinical, radiologic, and, in some cases, autopsy findings to confirm the presence of lesions attributed to abusive head trauma. Their article adds to the previous studies on confessions by perpetrators of abusive head trauma.<sup>3,4</sup>

The incidence of subdural hematoma, retinal hemorrhages, and cerebral injury, as well as the profiles of the perpetrators, are in keeping with those in numerous other studies. The central contribution of this article lies in the detailed descriptions of the events that took place from 29 perpetrators of those events, which elucidate the extreme violence of these actions. Confessions came during police custody or judicial investigation weeks or months after diagnosis. All of the perpetrators described a violent attack that they attributed to fatigue and irritation with the infant’s crying. All the confessions described shak-

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ing, which confirms the pathogenic nature of shaking even without impact.

In each case, the authors analyzed the number of violent acts and describe the delay between the shaking and the onset of symptoms. Repeated episodes occurred in more than half of the cases, and some occurred as many as 30 times “because it stopped the infant’s crying.” The authors opine that this repetition of shaking could account for the difficulty in dating injuries with computed tomography scanning. The perpetrators characterized the behavior of the child after the vio-

lence, the mechanism of the violence, and the presence or absence of impact. Impact occurred in 5 children, 4 of whom died. One-quarter of all victims had previous signs of maltreatment in their medical records. Thirty-eight percent had positive skeletal survey results. All the patients had subdural hematomas in at least 2 separate locations.

Perpetrator research has critics. There are those who will never trust any confessions and claim that they are obtained because the defendant is under duress, feels guilty or confused,

or has hopes of obtaining leniency. For ideologues who will always be skeptical about shaking injuries, for some medical experts who make a living by testifying that shaking cannot cause these injuries, and for those who simply deny the reality of child abuse, this study will be discounted as not being “evidence based.” However, Adamsbaum et al make a strong and compelling argument that violent shaking of a child, in response to the irritation of crying, does occur and that grievous damage can be done to a child in this fashion, even in the absence of impact.

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- 3 Starling SP, Patel S, Burke BL, Sirotiak AP, Stronks S, Rosquist P. Analysis of perpetrator admissions to inflicted traumatic brain injury in children. *Arch Pediatr Adolesc Med*. 2004; 158(5):454–458
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**Time for a Second Banana?:** Bananas are often described as perfect foods. Nutritious, cheap, and available year round, more bananas are consumed in the US than any other fruit. Yet, perfection may be the downfall of the “banana” as we know it. As reported in *Saveur* (Koeppell D, May 2010) the Cavendish banana, one of approximately 1000 banana cultivars, constitutes approximately one half the world’s banana production. Generally, it is the only banana found in Europe, Canada, and the US, and the 100 billion consumed each year are perfect—that is, perfectly identical genetically. While that makes for easy picking at the supermarket, it also makes them susceptible to disease. The Cavendish cultivar got its start when the dominant banana of first half of the 20<sup>th</sup> century, the Gros Michel cultivar, fell victim to a terminal fungal disease called Panama disease. Now a variant of Panama disease is wiping out Cavendish plantations around the world. It is only a matter of time before plantations in Central America, where the US gets the majority of its fruit, will be affected. Lots of tasty Panama resistant banana cultivars exist, but with importation tightly linked with the Cavendish, Americans would have to be willing to pay far more for a banana. It seems that monoculture, in all its forms, is fraught with danger and associated with considerable downsides.

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