

# The Challenge of Identifying Pediatric Abusive Head Trauma During the COVID-19 Pandemic

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Abusive head trauma (AHT) is a leading cause of traumatic death in infants and young children.<sup>1</sup> Children who suffer AHT are often subjected to repeated and sustained episodes of abuse; thus, timely identification is crucial and can be lifesaving.<sup>2</sup> However, there are numerous challenges associated with the identification of AHT. Because the clinical signs and symptoms can vary and be subtle, AHT can be missed by practitioners.<sup>3</sup>

The coronavirus disease 2019 (COVID-19) pandemic has had a profound adverse impact on families and households. As a result, concerns have been raised that children may be at increased risk for physical abuse and that some cases may go undiagnosed.<sup>4</sup> In this issue of *Pediatrics*, Maassel et al<sup>5</sup> report findings from a national study conducted in the United States that examined changes in the frequency of AHT hospitalizations during the COVID-19 pandemic. Using data from the Pediatric Health Information System database, the authors compared mean hospital admission rates for AHT and key demographic and admission characteristics at 49 children's hospitals during March to September 2020 with those across the same months of the preceding 3 years. There was a statistically significant decrease in hospital admissions for AHT during the COVID-19 pandemic compared with

each previous year. In addition, there were no statistically significant differences in the proportion of children who were admitted to an ICU, required a ventilator, presented with subdural or retinal hemorrhage, or died of their injuries.<sup>5</sup> The study findings echo those of a recent similar US study that used the Pediatric Health Information System database to investigate emergency visits and hospitalizations for all types of physical child abuse during the COVID-19 pandemic.<sup>6</sup>

As Maassel et al<sup>5</sup> note, their findings differ from earlier single-center studies documenting an increase in the number<sup>7</sup> or proportion<sup>8</sup> of children presenting with abuse-related injuries during the COVID-19 pandemic. Although the authors of one UK study reported an alarming 1493% rise in the incidence of AHT during the pandemic compared with equivalent time periods in the 3 previous years, the data represented only 1 institution over the first month of the national lockdown.<sup>7</sup> In contrast, Sanford et al<sup>9</sup> reported a decrease in the number of emergency department visits for blunt trauma at 1 US tertiary pediatric hospital during the first 2 months of the pandemic and no corresponding increase in the proportion of suspected abuse cases. A major strength of the studies conducted by Maassel et al<sup>5</sup> and Kaiser et al<sup>6</sup> is the inclusion of 6

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months of data from multiple children's hospitals across the United States. These studies highlight the value of national administrative data in facilitating rapid, population-wide child abuse surveillance studies that will ultimately help to inform public health policy and practice.

Maassel et al<sup>5</sup> hypothesized that because of the severity of AHT, it is difficult for caregivers to forgo seeking medical care for the child, implying that the decrease in hospitalizations represents a true decrease in AHT incidence. However, the brief acknowledgment that "mild cases of AHT may be able to forgo care"<sup>5</sup> necessitates discussion. Evidence suggests that even when medical care is sought, many AHT cases go unrecognized by medical professionals, even without the additional challenges posed by the pandemic.<sup>2,3,10,11</sup> Existing challenges in the identification of AHT have been exacerbated by COVID-19-associated physical-distancing measures. For example, national US data reveal that patterns in child abuse-related emergency department presentations changed during the pandemic.<sup>12</sup> Although the number of presentations decreased, the percentage requiring hospital admission increased in children aged 0 to 4 years, suggesting that less severe cases are not being brought for care. Such changes in health care use can be attributed in part to anxieties around contracting COVID-19.<sup>7</sup>

If milder AHT is being missed, we might expect more severe hospitalizations for AHT and/or physical abuse in the COVID-19 period compared with earlier time periods, which is not the case.<sup>5,6</sup> However, although hospital admission data are undeniably useful for assessing the scope of AHT and trends in incidence and case composition, they represent

only 1 piece of the puzzle. A recent study examining the accuracy of *International Classification of Diseases, 10th Revision, Clinical Modification* coding for physical child abuse revealed that AHT hospitalization data alone are likely to significantly underestimate the incidence of AHT and only represent the "tip of the iceberg" of likely cases.<sup>13</sup> Meanwhile, there is evidence that the incidence of AHT increases during and after an economic recession<sup>14–16</sup> and after a natural disaster.<sup>17</sup> For these reasons, the observed decrease in hospitalizations for AHT is indeed surprising. Although Maassel et al<sup>5</sup> conjecture that this decrease may be explained by more caregivers in the home, there may also be some underrecognition of cases. Kaiser et al<sup>6</sup> postulate that either (1) the true occurrence of abuse decreased similarly across the whole spectrum of severity or (2) presentation of abuse cases to medical care and/or missed cases decreased similarly across the whole spectrum of severity. Regardless, we agree with Maassel et al<sup>5</sup> that it is paramount to consider all possible explanations in these unprecedented times and that emerging hypotheses must be explored going forward.

Important questions remain regarding implications for the identification and prevention of AHT. What are the factors that are driving the changes in frequency of AHT hospital admissions, and how do we best study them? What does this mean for prevention interventions during and after the pandemic? If children are not being brought in for care, how can we ensure that risk factors of abuse and sentinel injuries are recognized? It is likely that a strengthened community approach is required.<sup>18</sup> Future research should be focused on untangling the factors driving changes in health care use and

designing and implementing interventions to better understand and mitigate the short- and long-term effects of COVID-19 on violence and abuse in children.

## ABBREVIATIONS

AHT: abusive head trauma  
COVID-19: coronavirus disease 2019

## REFERENCES

1. Duhaime AC, Christian CW, Rorke LB, Zimmerman RA. Nonaccidental head injury in infants—the "shaken-baby syndrome." *N Engl J Med*. 1998;338(25):1822–1829
2. Adamsbaum C, Grabar S, Mejean N, Rey-Salmon C. Abusive head trauma: judicial admissions highlight violent and repetitive shaking. *Pediatrics*. 2010;126(3):546–555
3. Jenny C, Hymel KP, Ritzen A, Reinert SE, Hay TC. Analysis of missed cases of abusive head trauma. *JAMA*. 1999;281(7):621–626
4. Martinkevich P, Larsen LL, Græsholt-Knudsen T, et al. Physical child abuse demands increased awareness during health and socioeconomic crises like COVID-19. *Acta Orthop*. 2020;91(5):527–533
5. Maassel NL, Asnes AG, Leventhal JM, Solomon DG. Hospital admissions for abusive head trauma at children's hospitals during COVID-19. *Pediatrics*. 2021;148(1):e2021050361
6. Kaiser SV, Kornblith AE, Richardson T, et al. Emergency visits and hospitalizations for child abuse during the COVID-19 pandemic. *Pediatrics*. 2020;147(4):e2020038489
7. Sidpra J, Abomeli D, Hameed B, Baker J, Mankad K. Rise in the incidence of abusive head trauma during the COVID-19 pandemic. *Arch Dis Child*. 2021;106(3):e14
8. Kovler ML, Ziegfeld S, Ryan LM, et al. Increased proportion of physical child abuse injuries at a level I pediatric trauma center during the Covid-19 pandemic [published online ahead of print September 25, 2020]. *Child Abuse Negl*. doi: 10.1016/j.chiabu.2020.104756

9. Sanford EL, Zagory J, Blackwell JM, Szmuk P, Ryan M, Ambardekar A. Changes in pediatric trauma during COVID-19 stay-at-home epoch at a tertiary pediatric hospital [published online ahead of print January 20, 2021]. *J Pediatr Surg*. doi: 10.1016/j.jpedsurg.2021.01.020
10. Letson MM, Cooper JN, Deans KJ, et al. Prior opportunities to identify abuse in children with abusive head trauma. *Child Abuse Negl*. 2016;60:36–45
11. Laurent-Vannier A, Bernard JY, Chevignard M. High frequency of previous abuse and missed diagnoses prior to abusive head trauma: a consecutive case series of 100 forensic examinations. *Child Abuse Rev*. 2020;29(3):231–241
12. Swedo E, Idaikkadar N, Leemis R, et al. Trends in U.S. emergency department visits related to suspected or confirmed child abuse and neglect among children and adolescents aged <18 years before and during the COVID-19 pandemic - United States, January 2019-September 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69(49):1841–1847
13. Hughes Garza H, Piper KE, Barczyk AN, Pérez A, Lawson KA. Accuracy of ICD-10-CM coding for physical child abuse in a paediatric level I trauma centre. *Inj Prev*. 2021;27(suppl 1):i71–i74
14. Berger RP, Fromkin JB, Stutz H, et al. Abusive head trauma during a time of increased unemployment: a multicenter analysis. *Pediatrics*. 2011;128(4):637–643
15. Huang MI, O’Riordan MA, Fitzenrider E, McDavid L, Cohen AR, Robinson S. Increased incidence of nonaccidental head trauma in infants associated with the economic recession. *J Neurosurg Pediatr*. 2011;8(2):171–176
16. Wood JN, French B, Fromkin J, et al. Association of pediatric abusive head trauma rates with macroeconomic indicators. *Acad Pediatr*. 2016;16(3):224–232
17. Keenan HT, Marshall SW, Nocera MA, Runyan DK. Increased incidence of inflicted traumatic brain injury in children after a natural disaster. *Am J Prev Med*. 2004;26(3):189–193
18. Molnar BE, Scoglio AAJ, Beardslee WR. Community-level prevention of childhood maltreatment: next steps in a world with COVID-19. *Int J Child Maltreat*. 2021; 3:467–481

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