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Chapter 31

Pediatric traumatic brain injury and abusive head trauma

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Abstract

Childhood traumatic brain injury (TBI) commonly occurs during brain development and can have direct, immediately observable neurologic, cognitive, and behavioral consequences. However, it can also disrupt subsequent brain development, and long-term outcomes are a combination of preinjury development and abilities, consequences of brain injury, as well as delayed impaired development of skills that were immature at the time of injury. There is a growing number of studies on mild TBI/sport-related concussions, describing initial symptoms and their evolution over time and providing guidelines for effective management of symptoms and return to activity/school/sports. Mild TBI usually does not lead to long-term cognitive or academic consequences, despite reports of behavioral/psychologic issues postinjury. Regarding moderate to severe TBI, injury to the brain is more severe, with evidence of a number of detrimental consequences in various domains. Patients can display neurologic impairments (e.g., motor deficits, signs of cerebellar disorder, posttraumatic epilepsy), medical problems (e.g., endocrine pituitary deficits, sleep–wake abnormalities), or sensory deficits (e.g., visual, olfactory deficits). The most commonly reported deficits are in the cognitive–behavioral field, which tend to be significantly disabling in the long-term, impacting the development of autonomy, socialization and academic achievement, participation, quality of life, and later, independence and ability to enter the workforce (e.g., intellectual deficits, slow processing speed, attention, memory, executive functions deficits, impulsivity, intolerance to frustration). A number of factors influence outcomes following pediatric TBI, including preinjury stage of development and abilities, brain injury severity, age at injury (with younger age at injury most often associated with worse outcomes), and a number of family/environment factors (e.g., parental education and occupation, family functioning, parenting style, warmth and responsiveness, access to rehabilitation and care). Interventions should identify and target these specific factors, given their major role in postinjury outcomes.

Abusive head trauma (AHT) occurs in very young children (most often <6 months) and is a form of severe TBI, usually associated with delay before appropriate care is sought. Outcomes are systematically worse following AHT than following accidental TBI, even when controlling for age at injury and injury severity.

Children with moderate to severe TBI and AHT usually require specific, coordinated, multidisciplinary, and long-term rehabilitation interventions and school adaptations, until transition to adult services. Interventions should be patient- and family-centered, focusing on specific goals, comprising education about TBI, and promoting optimal parenting, communication, and collaborative problem-solving.

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