

Pediatric Head Injury and Epilepsy: A One Act Play of Two Parts

Patricia Klaas, Ph.D.
Pediatric Neuropsychologist
Cleveland Clinic

Mechanisms of Head Injury

- The frontal and temporal lobes are most vulnerable.
- White matter shearing or Diffuse Axonal Injury
- Coup and contre coup injuries
- Acceleration and De-celeration

Head Injury

- Concussion or Concussive events
- Classifications: Mild, Moderate and Severe
- Classified using Glasgow Coma Score (GCS)
- The score is based on level of response to stimuli

Head Injury

- Traumatic brain injury (TBI) can result in a wide range of disabilities.
 - Communication and language
 - Memory, especially for new information
 - Perception
 - Attention and concentration
 - Judgment, planning and decision making
 - Cognitive flexibility

Head Injury: Social and Behavioral Problems

- Self Esteem
- Self-Control
- Awareness of self and others
- Sexuality
- Appearance and grooming
- Inappropriate behavior

Physical Problems

- Vision and Hearing
- Speed and coordination of movement
- Fatigue
- Poor balance/equilibrium
- Speech (dysarthria)
- Eye/hand coordination
- Visual-Spatial abilities

Concussion

- the mildest of head injuries?
- May or may not be seen in the ER/ED
- Not associated with a loss of consciousness
- Sequelae range from inattention to mild disinhibition
- What should you look for or what might you see...

Concussion (continued)

- Concussions mainly exacerbate problems the student may be having.
- Find out about loss of consciousness, slurring of speech, length of time they were "out of it", and if they saw a doctor and had imaging. The injury may or may not require that they see a physician...

Mild Head Injury

- Very, very short or even no loss of consciousness (the distinction between concussion and mild head injury is oftentimes a semantic one)
- Some disorientation immediately following the injury
- Some signs that they are still somewhat disoriented hours after the event.

Mild Head Injury (continued)

- The classification system requires that they verbally respond to a question, have their eyes open and can follow a command to some degree.
- The problem is...

Mild Head Injury (continued)

- When these kids come back to school, it is usually fairly soon after the injury. That's okay, as long as everyone is aware of the problems/challenges they might be facing and are not necessarily able to articulate.
- Attention, or problems maintaining attention is one of the biggest complaints.

Mild Head Injury (continued)

- Other complaints include some motor weakness or in-coordination, memory, double vision, blurry vision, and minor word finding difficulties, to name a few.
- Give them structure, schedules should be fairly rigid for at least a month following their return to school.

Moderate Head Injury

- Unconscious for minutes to hours.
- Usually noticeable motor involvement/weakness, usually confined to one side of the body.
- Imaging may show a collection of blood in the brain that may or may not require surgical intervention.

Moderate Head Injury

- These children will (usually) be referred to rehabilitation either inpatient or outpatient depending upon their medical status.
- Sequelae: Big time problems with attention, organization, following complex commands in an unfamiliar situation, speech and memory may be affected, motor coordination most probably will be affected.

Moderate Head Injury

- They may be out of school for weeks. When they come back, they may be walking and talking, but they won't be 100 percent.
- They need structure and more structure. If at all possible, reduce the class load until they can demonstrate they can handle it. NO SPORTS, nothing in which they might get knocked around and sustain another head injury.

Severe Head Injury

- Significant loss of consciousness > 12 hours
- "intubated and sedated" is a term frequently seen in the chart, pharmacologic coma is induced so that the patient does not move around and create more problems for themselves. It allows the brain time to recover without having to deal with incoming information.

Things to Consider

- Where is the child in terms of school placement? It is very likely to be a male, sophomore to senior, and unfortunately, the injury is a consequence of a motor vehicle accident. That's what the statistics say, though there are plenty of head injuries that occur to younger children who are female and not in a car.

More Things to Consider

- They may miss months of school. Rehabilitation does not usually address school subjects, though it would be a nice thing to see. How were they doing in school before the accident?
- This will dictate the approach to re-integration.

Classroom Considerations

- Impulse control is often an area of difficulty in children, especially after head injury. They will require a very structured environment until it can be determined whether or not they really need it.
- Judgment is another problematic area.

More Statistics

- One in four people have had or will have a head injury.
- Once you have a head injury, the probability of having another is two times more likely.
- Twice as many boys as girls have traumatic brain injuries

Even More Statistics

- The greatest number of head injuries occur in the mid to late teens.
- 1 out of every 550 school aged children will experience a head injury that could result in long term disability, every year.
- These stats are for TBI, and don't include things like lead poisoning, or stroke.

Possible Signs of They are "working the system"

- "amnesia" for family members, basic academic skills, information that is overlearned.
- Loss of early academic skills
- Claims of injury related impairments.

Part II: Pediatric Epilepsy

Definitions and Distinctions

- Epilepsy is a term used to refer to a recurrent seizure disorder caused by abnormal electrical discharges from brain cells, often in the cerebral cortex. It is not a distinct disease, it is a group of disorders for which recurrent seizures are the main symptom.

Definitions and Distinctions (cont.)

- Seizures: a component of epilepsy, but having a seizure does not mean that a person is epileptic or has epilepsy.
- Seizure frequency, status epilepticus-how frequently do seizures occur and when, SE means that the child is seizing uncontrollably.

Common Types of Seizures

- Absence: "deer in the headlights", unresponsive, short duration
- Simple partial seizures-most common, don't last a long time, may become pale, mouth or tongue movements, maybe some twitching, sudden extreme emotions.
- Complex partial seizures-maybe some alteration of consciousness, may stop speaking, act strangely or have repetitive movements.

Seizure types (continued)

- *Secondarily generalized*-partial seizures that start in one area of the brain and then spread to the entire brain. Probable loss of consciousness and convulsions.
- Seizures can have an unusual and sometimes frightening effect on a person's movement, emotions or sensations.

Auras

- Not consistently present in children with epilepsy.
- May be a feeling of fear, abdominal sickness, laughing, smells (usually something bad), tastes (also of something unpleasant), visual distortions
(associated with Simple Partial Seizures)

Generalized Seizures

- Absence-looks like day-dreaming, rare in adults, lasts from 3 to 30 seconds
- Clonic-convulsions with rhythmic twitches or jerks, 2-3 minutes
- Tonic-'drop' seizures, complete loss of muscle tone, may last a minute

Generalized Seizures (continued)

- Tonic-Clonic-grand mal, tonic followed by clonic phase, maybe an aura, maybe not, maybe stridor (high pitched sound when inhaling), sometimes loss of bowel and bladder control.

Benign Focal Epilepsy of Childhood

- Benign rolandic epilepsy of childhood occurs in children between the age of two and twelve, and accounts for fifteen to twenty percent of childhood epilepsy. Seizures become more frequent until age 7 to 10 and usually resolve by age 13.
- It has an excellent prognosis, and is usually associated with a positive family history.

Behavioral Aspects of Epilepsy

- Parents and teachers are less likely to consistently discipline children with epilepsy, especially if they are young and the seizures are poorly controlled.
- Consequently, these children may develop behavior patterns that are maladaptive, but extremely effective...for them.

The Epileptic Profile

- It depends...
- How long have they had the disorder?
- How frequently do they seize?
- Is there developmental delay?
- Was there developmental regression?
- How well controlled are the seizures?
- What is controlling the seizures?

Caveats

- Lots of variables to consider
- What is the current level of functioning?
- Is the family realistic in its appraisal of the child's abilities?
- Was the assessment a good measure of their skills?

The Epilepsy Foundation

2831 Prospect Avenue

Cleveland, Ohio 44115

Phone: (216) 579-1330

Toll-free 1-800-653-4300

Fax: (216) 579-1336

A terrific resource for information on epilepsy.