Improving Medical Provider Assessment of Childhood Trauma (IMPACT): Child Abuse

Handouts do not contain slides with case specific information and images

Objectives

- Identify sentinel injuries of child abuse
- Discuss the physical findings commonly seen in outpatient child abuse evaluations
- Delineate the role of medical provider in identifying and reporting infants with in utero substance exposure
- Review the role of the medical professional as a mandated reporter of child abuse

“The Battered Child Syndrome”

- Landmark article published in JAMA in 1962
  - The article contained the results of a survey of district attorneys who reported a large number of children were being severely beaten
- This article alerted medical professionals to the problem of child abuse
- Between 1963 and 1968 all fifty states enacted mandatory reporting laws


Types of Reported Abuse

- 54% NEGLECT
- 14% PHYSICAL ABUSE
- 9% SEXUAL ABUSE
- 7% EMOTIONAL ABUSE
- 16% OTHER


Risk Factors for Child Abuse: Child Characteristics

- Age < 3 years
- Premature birth/Low birth weight
- Impaired bonding
- Children with chronic illness
- Physical disabilities
- Emotional/behavioral difficulties
- “Difficult” children
- Unwanted child

**Risk Factors for Child Abuse:**

**Parent Characteristics**
- Parents abused as children
- Family stressors and lack of support
  - Money, homelessness
- Lack of appropriate parenting skills
- Mother <20 years
- Limited education (<high school)
- Low self esteem/depression
- Alcoholism, addiction, or psychosis
- Unrealistic expectations of child’s behavior

**Social & Situational Stresses**
- Isolation
- Family/domestic violence
- Non biologically-related male in the home
- Poverty
- Unemployment/financial problems
- Single parent

**Triggering Situations**
- Crying
- Fussy baby
- ‘Misbehavior’
- ‘Discipline’
- Family conflict
- Vomiting
- Toilet training
- Unknown

**Indicators of Child Abuse and Neglect**
- Histories inconsistent with injuries
- History incompatible with child’s development
- History that changes with time
- Contradictory histories
- Delay in seeking treatment
- Pathognomonic injuries

**Sentinel Injuries**

---


---

Box 1

**Definition of sentinel injuries**
- Minor injuries, such as a bruise or intraoral injury (excluding skin abrasions)
- Premature infant
- Visible or detectable to a caregiver
- Poorly explained and unexpected

Child Abuse Injuries

Cutaneous Injuries
Fractures
Abdominal Trauma
Head Trauma
Neglect

TEN 4 Algorithm
Torso, Ears, Neck, <4 years

- 0 to 48 months of age
- N=42 abuse, N=53 accidental
- Developed decision rule for predicting abusive trauma
- Predictors of abuse:
  - Bruising on the torso, ear or neck for kids <4 years
  - Any bruising on infant <4 months
TEN4 FACES-P –
2200 subjects

- Torso
- Ears
- Neck
- <4 years (or any bruise less than 4.99 months)
- Frenulum
- Angle of jaw
- Cheek
- Eyelid
- Subconjunctival
- Patterned injury

Burn Injuries

Importance of Time in Causation of Cutaneous Burns

<table>
<thead>
<tr>
<th>Water temperature</th>
<th>Duration of Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>120°F (49°C)</td>
<td>15 minutes</td>
</tr>
<tr>
<td>130°F (55°C)</td>
<td>30 seconds</td>
</tr>
<tr>
<td>140°F (60°C)</td>
<td>5 seconds</td>
</tr>
<tr>
<td>149°F (65°C)</td>
<td>2 seconds</td>
</tr>
<tr>
<td>158°F (70°C)</td>
<td>1 second</td>
</tr>
</tbody>
</table>


Fractures in Child Abuse

- Fractures seen in 5-18% of abused children
- History is key
  - Timing
  - Mechanism
- Age of patient
  - Developmental stage
  - Activity level

Abusive Fractures

- 13 skull fractures
- Ribs accounted for 51% of skeletal injuries
- 116 fractures healing (79%)
- 29/31 infants with at least one healing fracture

In the clinical setting, the type, direction and magnitude of a fracturing force can be inferred from the radiographic appearance of the resultant fracture.”

http://www.pbs.org/wgbh/buildingbig/lab/forces.html

The Skeletal Survey

- Plain x-ray studies
- Mandatory in all cases of suspected abuse in kids <2 years
- Patients age 2-5 years based on clinical indicators

<table>
<thead>
<tr>
<th>Table 1. The Standard Skeletal Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix/sacroiliac Joint</td>
</tr>
<tr>
<td>Fossa navicular (N)</td>
</tr>
<tr>
<td>Hip joint (iliopsoas F)</td>
</tr>
<tr>
<td>Femur (L, R)</td>
</tr>
<tr>
<td>Tibia and fibula (L, R)</td>
</tr>
<tr>
<td>Ankle (L and R)</td>
</tr>
<tr>
<td>Throat (SC and larynx)</td>
</tr>
<tr>
<td>Pyle (L, R including mid and lower lumbar spine)</td>
</tr>
<tr>
<td>Lumbar vertebra (spine)</td>
</tr>
<tr>
<td>Hand (both); wrist (both)</td>
</tr>
<tr>
<td>Hip (bone and acetabulum)</td>
</tr>
<tr>
<td>Technique</td>
</tr>
<tr>
<td>High resolution</td>
</tr>
<tr>
<td>True cephalic</td>
</tr>
<tr>
<td>Projection(s) over extended arm to cover 200</td>
</tr>
<tr>
<td>Low kVp (bone technique)</td>
</tr>
<tr>
<td>Single oblique or special film-screen combinations</td>
</tr>
</tbody>
</table>


Abusive Head Trauma

- 64% of head injuries in infants (<1 year) are abusive
- 95% of infants with serious intracranial injuries are abusive
- 33-40% cases have evidence of previous head trauma
- Male victims predominate
- 35% have no obvious external trauma
- Mortality rate 15-38%

Analysis - Missed Cases of Abusive Head Trauma (AHT)

- 173 cases
- Clinical presenting problems:
  - Vomiting
  - Irritability
  - Altered mental/Respiratory status
  - Facial/Scalp Injury
  - Seizures

Missed Cases of AHT

- 31% Cases were Missed
- Younger (6 months vs. 9 months)
- White
- Both Parents Living with Child
- Milder Symptoms
  - NOT assoc: prematurity, birthweight, parents employment, private insurance, sex of child

Predictors of Correct Diagnosis of AHT

- Abnormal Respiratory Status
- Seizures
- Facial/Scalp Injury
- Parents Not Living Together
- If none of these factors present, likelihood of physician recognizing AHT is < 1 in 5.

Diagnoses Confused with AHT

- Viral Gastroenteritis
- Accidental Head Injury
- R/O Sepsis
- Increasing head size
- Otitis Media, Seizure Disorder
- Reflux, Apnea
- URI, UTI, Bruising, Hydrocephalus, Meningitis


Missed AHT Outcomes

- Almost 10% (5/54) missed cases died as a result of head injuries
- 4 of 5 deaths could have been prevented by earlier recognition
- 28% known to have been re-injured 2° to delay in diagnosis
- In 7 missed cases, radiological errors contributed to delay in diagnosis


How to Prevent Missed Diagnosis

- Examine WHOLE child
- Look for facial/scalp injury
- Measure, plot head circumference
- If LP done, bloody fluid:
  - Successive tube clearing
  - Xanthochromia
- Pediatric Radiologists
- Consider AHT in Differential Diagnosis


Primary Prevention of AHT

(aka shaken baby syndrome)

Primary Prevention of AHT

- Western NY, 1998-2004
  - One page educational leaflet
  - Video – 11 minutes
  - Education posters
  - Follow-up telephone interview
- Simple and quick intervention


Primary Prevention of AHT

- 62,405 signed Commitment Statements (60% of all live births)
- Incidence of SBS
  - PRE: 41.5 cases/ 100,000 live births (8.2 cases/year)
  - STUDY: 22.2 cases/ 100,000 live births (3.8 cases per year)
  - Decline of 47% p=0.0168
- Subgroup analysis (21 cases of SBS)
  - 7 no exposure to program
  - 3 refused to sign CS
  - 10 CS signed (9 fathers, 1 mother)
  - 1 unknown birth hospital


The Crying Infant

- Crying is a normal behavior in infants
- It is essential to their survival
  - Babies communicate specific needs with non-phonetic crying
  - It’s up to caregivers to determine what needs, if any, are unfulfilled
  - Should not be met with resentment on parents’ part
  - Does not reflect on them as parents

Crying and Head Injury

- Crying is important stimulus for abusive head trauma (SBS)
- Provides evidence of the importance of timing of prevention programs
  - 2 weeks of life
- Prevention programs should emphasize unique properties of early crying and potential of crying to frustrate care providers
  - Opposed to “never shake your infant” campaigns

The Period of Purple Crying

- Educational based program:
  - 11 page handout
  - 10 minute video
- Available in 8 different languages
- Three action steps:
  - Increase carry, comfort walks, and talk response
  - Crying can be frustrating. If so, walk away, calm yourself, return to infant
  - Never shake or hurt your infant

The Letters in PURPLE Stand for

- PEAK OF CRYING: Your baby may cry more each week. The most at 2 months, then less at 3-6 months
- UNEXPECTED: Crying can come and go, and you don’t know why
- RESISTS SOOTHING: Your baby may not stop crying no matter what you try
- PAIN-LIKE FACE: A crying baby may look like they are in pain, even when they are not
- LONG LASTING: Crying can last as much as 5 hours a day, or more
- EVENING: Your baby may cry more in the late afternoon and evening
Drug Abuse in US

- 22.6 million Americans (8.9%) used illicit drugs in the month before the survey
- 4.4% of pregnant woman admitted to substance abuse in last month
- 10.9% of nonpregnant woman with substance abuse in last month
- Alcohol use in pregnant woman estimated at 10.8%


Drug Exposure/Neglect

Effects on the Fetus

- Difficult to make direct correlation
  - Multiple biological and psychosocial risk factors
- Direct mechanism on brain development
  - Alteration in development of brain
- Indirect
  - Variations in maternal placental functioning and physiology
  - Carboxyhemoglobin causes vasoconstriction

Effects on Newborn

- Drug-related adverse birth outcomes
  - Preterm birth, LBW, growth restriction
- Neonatal abstinence syndrome
  - Signs indicating dysfunction of respiratory, gastrointestinal, or nervous system regulation
- Neurobehavioral and regulatory impairment
  - Tremors, irritability, hypertonicity, increased startle, feeding problems
- Structural changes
  - Congenital anomalies - FAS
- Environmental or caregiving deficiencies

Effects on the Fetus

- Marijuana – brain cannabinoid receptors regulate neuronal proliferation, migration, differentiation, and survival
- Methamphetamine – increase amount of dopamine and serotonin
- Opioids – migration and survival of neurons

Fetal Substance Exposure

Effects

<table>
<thead>
<tr>
<th>Effect</th>
<th>Alcohol</th>
<th>Marijuana</th>
<th>Opium</th>
<th>Cocaine</th>
<th>Methamphetamine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term effects or birth outcome</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fetal growth</td>
<td>+++</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Abnormalities</td>
<td>+++</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Neurobehavior</td>
<td>+</td>
<td>*</td>
<td>*</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Long-term effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth</td>
<td>+++</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Behavior</td>
<td>+++</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Unknown</td>
</tr>
<tr>
<td>Cognition</td>
<td>+++</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>Unknown</td>
</tr>
<tr>
<td>Language</td>
<td>+</td>
<td>-</td>
<td>Unknown</td>
<td>+</td>
<td>Unknown</td>
</tr>
<tr>
<td>Achievement</td>
<td>+++</td>
<td>-</td>
<td>Unknown</td>
<td>+</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

Adapted with permission from Bemke et al (2016). +++ , strong effect.; +, effect.; +, no consensus about effect.; - , no known effect.

Substance Abuse and Child Maltreatment

• Acutely intoxicated or withdrawing parent does not respond to infant cues
• Impaired judgment and priorities
• Multiple other problems in the home — mental illness, poor parenting skills, DV, criminal activity, lack of resources


Drug Exposed Infant Issues

• Screening test vs confirmatory test
• Report early or late
• Discharge planning

Drug Testing Mother or Infant

• Indications for testing (variable)
  – Maternal history
    • History of drug abuse
    • Late prenatal care (>16 weeks)
    • History of domestic violence
    • Unexplained placental abruption
    • History of child abuse or neglect
  – Infant History
    • Unexplained intrauterine growth retardation (IUGR)
    • Infant with evidence of drug withdrawal

Maternal vs. Infant Drug Testing

• Narrow window of detection
• Affected by hydration status
• Recent vs. remote drug use
• Urine vs. Cord testing
  – Both is ideal — now and prior use

Timing of Detection

Fig. 2. Window of detection for biological specimens. The window of detection varies depending on the sample chosen for drugs of abuse screening. (From Locenso J, Garcia-Algar O, Vall O, et al. Biological matrices for the evaluation of in utero exposure to drugs of abuse. Ther Drug Monit 2002;24:711–24, figure 2 with permission.)

Family Violence and Child Abuse

Case (continued)

- Eye examination with severe, bilateral, multilayered retinal hemorrhages
- No skeletal injuries
- The child met brain death criteria within 24 hours of hospitalization

Types of Child Injuries resulting from DV

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Patients, n (%)</th>
<th>%</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct hit</td>
<td>50 (36)</td>
<td>36.0 (28.9–44.9)</td>
<td></td>
</tr>
<tr>
<td>Hit by an object</td>
<td>38 (27)</td>
<td>27.3 (20.1–35.5)</td>
<td></td>
</tr>
<tr>
<td>Thrown/pushed</td>
<td>21 (15)</td>
<td>15.1 (6.6–22.2)</td>
<td></td>
</tr>
<tr>
<td>Dropped</td>
<td>15 (11)</td>
<td>10.8 (6.2–17.2)</td>
<td></td>
</tr>
<tr>
<td>Burned</td>
<td>12 (9)</td>
<td>8.6 (4.5–14.6)</td>
<td></td>
</tr>
<tr>
<td>Stabbed</td>
<td>4 (3)</td>
<td>2.9 (0.6–7.2)</td>
<td></td>
</tr>
<tr>
<td>Stabbed</td>
<td>3 (2)</td>
<td>2.2 (0.4–6.2)</td>
<td></td>
</tr>
<tr>
<td>Ckmun.Add</td>
<td>1 (0.7)</td>
<td>0.7 (0.2–3.9)</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>3 (2)</td>
<td>2.2 (0.4–6.2)</td>
<td></td>
</tr>
</tbody>
</table>


Domestic Violence
Multivariable Analysis of Factors Associated with Physical Abuse in US Children

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Reported Physical Abuse</th>
<th>Substantiated Physical Abuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic violence in the home</td>
<td>1.5 (1.5, 1.5)</td>
<td>2.5 (2.4, 2.5)</td>
</tr>
<tr>
<td>Parental alcohol/drug use</td>
<td>0.9 (0.9, 0.9)</td>
<td>2.2 (2.1, 2.2)</td>
</tr>
<tr>
<td>Child is prior victim of abuse/neglect</td>
<td>0.8 (0.8, 0.9)</td>
<td>1.6 (1.6, 1.7)</td>
</tr>
<tr>
<td>Child behavior problem</td>
<td>1.7 (1.6, 1.7)</td>
<td>1.4 (1.3, 1.5)</td>
</tr>
<tr>
<td>Public assistance</td>
<td>0.5 (0.5, 0.5)</td>
<td>1.3 (1.2, 1.3)</td>
</tr>
<tr>
<td>Male gender</td>
<td>1.1 (1.1, 1.2)</td>
<td>NSv</td>
</tr>
</tbody>
</table>

AAP Domestic Violence Policy

- “The abuse of women is a pediatric issue”
- “Child abuse occurs in 33% to 77% of families in which there is abuse of adults”
- Questions about family violence should become part of anticipatory guidance

Domestic Violence Screening

- AAP recommends pediatricians screen for domestic violence
- Domestic violence is a known risk factor for child abuse
  - It IS a pediatric problem
- Limited training and experience of providers limits screening
- Lack of standard curriculum in medical school and residency training

Pediatric Residency Training on DV

- Survey of 127 Pediatric Chief Residents
  - 22% report no training in domestic violence
  - 58% report <4 hours of training
- Lack of sufficient training leaves residents feeling unprepared to routinely discuss with families

**TABLE 2. Chief Residents’ Reports of Domestic Violence Screening Behaviors**

<table>
<thead>
<tr>
<th>Statement</th>
<th>No. (%) of Respondents Who Responeded “Yes”</th>
</tr>
</thead>
<tbody>
<tr>
<td>I screen every patient’s family</td>
<td>27 (21)</td>
</tr>
<tr>
<td>I screen when the child has behavioral problems</td>
<td>57 (45)</td>
</tr>
<tr>
<td>I screen when the child does poorly in school</td>
<td>29 (23)</td>
</tr>
<tr>
<td>I screen when the child seems depressed</td>
<td>60 (47)</td>
</tr>
<tr>
<td>I screen when the child seems socially withdrawn</td>
<td>61 (48)</td>
</tr>
<tr>
<td>I screen when the child has developmental delays</td>
<td>22 (17)</td>
</tr>
<tr>
<td>I screen when the child has a pattern of acting violently</td>
<td>74 (59)</td>
</tr>
<tr>
<td>I screen when the adolescent abuseal has symptoms</td>
<td>53 (42)</td>
</tr>
<tr>
<td>I screen when I suspect the child is being abused or neglected</td>
<td>98 (75)</td>
</tr>
<tr>
<td>I screen when the child has evidence of physical abuse</td>
<td>95 (73)</td>
</tr>
<tr>
<td>I don’t screen for spousal abuse or domestic violence</td>
<td>5 (4)</td>
</tr>
</tbody>
</table>

Domestic Violence and Child Abuse

- What question do you ask?
  - Is there abuse in the home?
  - Have you been physically, emotionally, or sexually assaulted in the home?
  - Has anyone in the home been arrested?
  - Do you fear for your safety or the safety of your children in the home?

Child Protection Process in Idaho
Child Protection Process

- Report to child abuse hotline (child welfare)
- Consider report to law enforcement (particularly when concerned with safety)
  - In Idaho police make determination of imminent danger
- Explain concerns to investigator
- If meets criteria child welfare will meet with child and/or family

Idaho Reporting Law

- Having reason to believe
  - Any physician, dentist, hospital staff, coroner, medical examiner, school employee, direct worker, school public employee, medical examiner or other officer having reason to believe that a child under the age of eighteen (18) years has been abused, neglected or exploited or who believes the child being referred has occasion to reasonable cause to believe that such a child is being abused or neglected or exploited shall report such information to the child protection agency or the department. The departments shall be bound by law enforcement to report such matters to the department. Such matters shall be subject to the duties and powers of the department.
  - Examine the written or oral report of the witness or informant
  - The written report shall be served upon the child protection agency or the department

Identifying and Reporting Child Abuse

Child abuse training in medical school and post-graduate training

- Highly variable
- No defined standard
- Most major academic centers have hospital based child protection teams
- Experiential / case based

Barriers

- “Not in my practice”
- “I want to know for sure”
- “But the parents are so nice”
- “I have known them for years, they didn’t do anything to this baby”
- “It didn’t cross my mind”

“From Suspicion of Physical Child Abuse to Reporting: Primary Care Clinician Decision-Making”

- 327 clinicians
- 1683 injuries seen in clinic with some suspicion of abuse

<table>
<thead>
<tr>
<th>TABLE 2</th>
<th>Level of Clinician Suspicion According to Decision to Report to CPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Status</td>
<td>Level of Suspicion, n (%)</td>
</tr>
<tr>
<td>Unlikely</td>
<td>Possible</td>
</tr>
<tr>
<td>Reported to CPS</td>
<td>7 (3.6)</td>
</tr>
<tr>
<td>Not reported to CPS</td>
<td>1464 (96.4)</td>
</tr>
</tbody>
</table>

The adjustment described in the text was used. The actual number of injury visits with some suspicion was 1683.

“From Suspicion of Physical Child Abuse to Reporting: Primary Care Clinician Decision-Making”

- Clinicians reported 95 (6%) of the 1683 patients to child protective services.
- Clinicians did not report 27% of injuries considered likely or very likely caused by child abuse and 76% of injuries considered possibly caused by child abuse.

If you suspect abuse:

- DON'T try to investigate
- DON'T confront the abuser
- DO report your reasonable suspicions

Informing the Family

- Common ground = Concern for the child
- Ensure safety of child, yourself, and office staff
- Be honest, non-judgmental and direct
- Review medical findings
- Avoid confrontation
- Report based on suspicion but not certainty

Is a Mandated Reporter Protected from Liability?

- YES – Your report is confidential and immune from civil or criminal liability as long as the report is made in "good faith" and "without malice."
  - In good faith means that the person making the report took reasonable steps to learn facts that were readily available and at hand.
  - Without malice means that the person did not intend to injure or violate the rights of another person
It is imperative to consider child abuse in the differential diagnosis of any child who presents with injuries or illness that may have resulted from family violence or dysfunction regardless of race, socioeconomic class, or other perceived risk factors for abuse.

Summary

- Child abuse is pervasive and under-recognized
- Index of suspicion and reporting is key
- CARES program available to assist with challenging cases
  - Physical abuse
  - Sexual abuse
  - FTT/Neglect