Early Detection and Effect of Child Abuse and Neglect

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Objectives
At the end of this presentation you will be able to:

- Recognize high risk injuries for abuse in infants and toddlers
- Discuss the latest evidence with regard to bruises and retinal hemorrhages in infants and toddlers
Shaken Baby Syndrome VS Abusive Head Trauma

- 2009 AAP statement from the Committee on Child Abuse and Neglect
- The term abusive head trauma was recommended to replace shaken baby syndrome
- More inclusive of all potential mechanisms of injury

Christian, 2009

Abusive Head Trauma

- More child abuse deaths occur from abusive head trauma than any other type
- Those who survive often have serious neurologic sequelae
- Abusive head trauma in infants and toddlers can present with nonspecific symptoms and can be missed
Abusive Head Trauma

- A three week old presents fussiness

Suggestions for facilitating the diagnosis of abusive head trauma *Jenny et al 1999*

- Be alert for bruises or abrasions on the faces or heads of children presenting with nonspecific symptoms
- The presence of bruises - especially bruises of the face or head - in infants raises the possibility of inflicted injury
Suggestions for facilitating the diagnosis of abusive head trauma *Jenny et al 1999*

- When evaluating infants and toddlers with nonspecific symptoms, such as vomiting, fever, or irritability, consider abusive head trauma in the differential diagnosis.
- Perform a head-to-toe physical exam and be alert for signs of trauma.

Abusive Head Trauma

- Sunset eyes are a sign of increased ICP and/or hydrocephalus.
- Feel for split sutures and a tense fontanelle.
- This infant had severe bilateral subdural hematomas and evidence of repeated head injury on CT.
Suggestions for facilitating the diagnosis of abusive head trauma

Jenny et al. 1999

- When collecting spinal fluid in cases of suspected infantile sepsis, examine any bloody cerebrospinal fluid for xanthochromia.
- Xanthochromia can represent old blood in the CSF from previous trauma.

- Consult a pediatric radiologist to interpret x-rays and CT's in cases of suspected child abuse.
- Have the infant/child examined for retinal hemorrhages.
- Be connected with expert consultants in Child Abuse and Neglect.
Bruises in Infants and Children
Number of Bruises

- Study by Pierce et al *Pediatrics* 2010
- Children ≤4 years were included
- Children with abuse were compared to children with accidental injury
- Children with abuse - median # of bruises = 6
- Children with accidental trauma - median # = 1.5
- All patient with accidental trauma had ≤4 bruises
Bruises in Infants and Children
Location of Bruises

- Pierce study
- All bruising to the genitourinary area and hip occurred only in patients with abusive trauma
- All bruising to the ear, neck, hands, right arm, chest and buttocks were predictive of abuse
Regions of the body (shaded area) where bruises were significantly more likely to occur in a child with confirmed physical abuse than in one where physical abuse was excluded.

Alison Mary Kemp et al. Arch Dis Child 2014;99:108-113

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**Bruises in Infants and Children**

*Age/Developmental Stage of the Child*

- Study by Sugar et al of 973 infants and toddlers <36 months
- Infants <9 m rarely have bruises that are not related to known medical conditions
- Infants <6 m did not have bruises on the face, trunk or extremities
- Bruises on the anterior lower leg and knee, as well as the upper leg and forehead are common in cruising and walking toddlers
Bruises in Infants and Children
Age/Developmental Stage of the Child

- Bruises on the check, back, chest and upper arm are much less commonly observed but may be seen in infants as they begin to walk independently.
- Bruises on the abdomen, buttocks, hands and feet are extremely rare in both infants/toddlers.
- Bruises that are not over bony prominences are uncommon.

Bruises in Infants and Children
Pattern Bruises
Bruises in Infants and Children

Pattern Bruises

Can bruises be dated accurately?

- Maguire et al. *Arch Dis Child*. Systematic review. 2005
- The appearance of bruises are influenced by location, bleeding tendency, skin color, force of injury, depth and extent of sub Q extravasation
- **Conclusion:** A bruise cannot accurately be aged from clinical assessment in vivo or on a photograph. At this point in time the practice of estimating the age of a bruise from its color has no scientific basis and should be avoided....
Retinal Hemorrhage in Abusive Head Trauma

- 2010 comprehensive review on Retinal Hemorrhage in Abusive Head Trauma by Levin in *Pediatrics*
- The etiology of retinal hemorrhages are highly suspicious for abuse when:
  - Child is <3 yrs
  - No evidence of direct globe injury
  - When the hemorrhages are multilayered and widespread

Retinal Hemorrhage in Abusive Head Trauma

- Non-ophthalmologists do well at identifying the absence or presence of RH but do not describe them in as much detail as ophthalmologists
Retinal Hemorrhage in Abusive Head Trauma

- RH alone should rarely if ever be used to diagnose child abuse without other supportive historical, physical, radiologic and laboratory evidence.
- Overwhelming evidence supports that severe RH in otherwise previously healthy children without obvious history to the contrary is from abusive head trauma.

Fractures in Infants and Children and Child Abuse Flaherty et al *Pediatrics* 2014

- Fractures are the 2nd most common injury caused by child physical abuse.
- There are 5 fractures with high specificity for child abuse in infants:
  - Metaphyseal corner fractures
  - Rib fractures – especially posteromedial
  - Scapular fractures
  - Spinous process fractures
  - Sternal fractures
Fractures in Infants
Metaphyseal Corner Fractures

- Observed in children <2 yrs
- The fracture most specific for nonaccidental injury
- Common in abused children ~50%

Rib Fractures in Infants

Posteromedial in location
Multiple and bilateral

Case courtesy of Dr Hani Al Salam, Radiopaedia.org, rID: 13614
Summary

- When you see unexplained bruises on the face of an infant rule out abusive head trauma
- Age of the child, location, number and shape are important considerations in the evaluation of bruising
- Metaphyseal corner fractures and rib fractures in infants are highly specific for abuse

References

References


