PHYSICAL INDICATORS OF CHILD ABUSE

A Newsletter For Those Who Care For Children

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BEHAVIORAL OBJECTIVES

After reading this newsletter the learner will be able to:

1. Discuss physical indicators of abuse in infants and children.
2. Describe assessment of injuries and burns suspicious in physical abuse, as well as head and abdominal injuries.

An estimated 4 million cases of child abuse occur yearly in the U.S., although probably less than half of all cases are reported. Approximately 10% of pediatric ER trauma visits are believed to be abuse-related. Physical abuse, the deliberate infliction of physical injury, accounts for 20% of all cases of child abuse and is the leading cause of death in infants and children who are maltreated. Parents are the most common perpetrators of physical maltreatment, but such abuse may be inflicted by any caregiver. The risk of death is as high as 25% in children who are physically abused, with brain injury being the most common cause of death, as well as serious injury and disability.

Physical child abuse affects children of all ethnic groups and socioeconomic status. However, anything that increases stress on a family, such as poverty or unemployment, increases the risk of abuse. At the same time, it is important for healthcare providers to not make the mistake, so well documented in the literature, of failing to suspect injuries in infants whose parents or caretakers appear to have a higher socioeconomic status. For example, abusive injuries are missed more often in white children of two-parent families. Each infant and child with injuries needs to be assessed objectively.

This newsletter will discuss physical indicators of abuse in infants and children. Assessment of injuries and burns suspicious in physical abuse, as well as head and abdominal injuries will be described. An upcoming newsletter will discuss behavioral signs of abuse often seen in the child and abuser, as well as implications for the healthcare provider.

PHYSICAL ABUSE – INTENTIONAL INFliction OF INJURIES

Injuries related to physical abuse are not accidents. They are intentionally inflicted, usually by a parent or caregiver. The physical assault on a child may be made on any part of the child’s body using any instrument that causes physical harm, such as the abuser’s hand or fist, a chain, wire hanger, wooden spoon or high-heeled shoe. Kicking, pinching, biting, burning, or any other harmful contact, are also common means used to inflict bodily injury on a child.

Although physical abuse typically leaves identifiable signs, often in various stages of healing, not all physical abuse injuries are visible. For example, Shaken Baby Syndrome (SBS) results from the violent shaking of an infant or small child causing significant head injuries. It is also a form of physical child abuse, but SBS victims rarely have any external evidence of trauma. Both physical and behavioral signs, of the child, as well as abuser, may indicate physical abuse.

UNEXPLAINED PHYSICAL INJURIES:

Injuries appearing on the child’s body which are not areas usually injured through play or accidentally running into objects should be considered suspicious of physical abuse. Injuries from accidental falls cause bruises primarily on bony prominences and only on one side of the body. For example, when unsteady toddlers fall down, they usually bump their knee, shin or forehead. Bruises on the upper or forearm and thigh may also normally occur from bumping into objects. However, bruises to the neck, wrists, ankles, torso, back, buttocks, genitalia, thighs, and backs of arms or legs, should be considered suspicious of abuse. Additionally, bruises or tears of the upper or lower lip and frenulum (the thin strip of tissue that runs vertically from the floor of the mouth to the undersurface of the tongue) may be the result of forced feeding, or from blows or slaps across the mouth.

Mongolian spots, a common pigmentation variation in children of deep pigmentation, should not be confused with bruises from abuse. Mongolian spots do not change in color or fade and are present at birth. They can be seen in African American, Asian, American Indian, and Hispanic populations.

Bruises in various stages of healing are a common indicator of on-going abuse. Bruise color is affected by the location and depth of the injury as well as the child’s complexion.
As a guideline, generally, a new bruise will be reddish, turning to bluish-purple or black, then to a yellowish-brown or greenish color. Bruises usually fade in about 2 weeks.

Clusters of injuries, such as burns from cigar or cigarette, squeeze or pinch marks, or "loop" injuries, those caused by doubling an electrical cord or rope, usually evident on the child’s arms, legs neck or torso, are highly suspicious of abuse. Also, injuries that form a regular pattern, reflecting the shape of the article used to inflict the injury, such as a hair brush, coat hanger, wooden spoon, chain or belt buckle, as well as handprints are suspicious of child abuse.

Burns which are patterned like an object, such as an electric burner, radiator, iron or curling iron should also be considered suspicious. Burns in which there are no splash marks, particularly occurring bilaterally, are suggestive that the child was immersed in scalding water. Immersion burns, where there is a line of demarcation between normal and burned skin, may appear sock-like, glove-like, or on the buttocks and/or genitalia, doughnut-shaped –"dunking syndrome".

Although a human bite mark may be a one-time occurrence from siblings or peers, especially in young children, certain bites may suggest abuse. Human bite marks compress the flesh, in contrast to animal bites, which tear the flesh and leave narrower teeth imprints. After measuring the diameter of a bite mark, from canine to canine, if the distance is greater than 3 cm, the bite was probably by an adult and could be from physical and/or sexual abuse. In some cases, the bite mark can be swabbed for DNA to help identify the perpetrator.

Additionally, patches of baldness in a child caused by pulling out of the hair (traumatic alopecia) should alert healthcare providers to the possibility of abuse. If it is a recent injury, bleeding under the scalp where the hair used to be, may also be noted. Before the child has full head control, usually by 6 months of age, or if the child rubs his or her head back and forth while in a car seat, bald patches on the back of the skull may normally occur. Fungal infections, such as ringworm, as well as malnutrition, can also cause hair loss unrelated to physical abuse.

UNEXPLAINED FRACTURES: More than 20% of abused children have radiologic evidence of bone trauma. Because of the elasticity and porousness of the bones of infants, generally, the forces needed to break a bone in this age-group are enormous. Any fracture in a child under 1 year or so needs careful screening for potential abuse. As children begin walking and become more mobile, the suspicion of a child-abuse-related fracture decreases.

Multiple new or old fractures in various stages of healing are suspicious of physical abuse. Fractures may also occur repeatedly to the same site or may involve unusual sites, such as the distal lateral clavicle, ribs, scapula, or sternum. Long bone fractures are highly suggestive of abuse in infants. The classic fracture of abuse is the epiphyseal metaphyseal chip fracture. This fracture may appear as a bucket-handle or corner fracture as a result of the child’s limb being violently jerked, twisted or shaken. A specific type of fracture, a complete distal femur metaphyseal fracture, a complete break of the thigh bone, is often seen in infants who have been abused. Spiral fractures of long bones and fractures that extend into the growth plates are also suspicious for abuse.

However, the location of the fracture and the age of the child should be considered. For example, a midshaft spiral femur fracture in a 6-month-old infant is likely abuse caused by twisting the child’s leg. However, a spiral fracture may occur in a 3-year-old child secondary to a twisting fall, which is likely accidental.

Rib fractures in young children who are not involved in a motor vehicle or pedestrian accident are highly indicative of inflicted injury caused by an adult wrapping his or her hands around the child’s chest and squeezing it. Posterior rib fractures, which is the the weakest point where the ribs connect to the spinal column, appear to be more specific for inflicted injury than lateral rib fractures.

Skull fractures that are multiple, depressed, bilateral and/or that cross suture lines, may indicate the child has received an intentional blow to the skull. The infant’s skull is pliable, due to open fontanels and suture lines, which widen or compress to protect the brain from direct trauma during the birthing process. Therefore, it takes a great deal of force to cause a skull fracture in infants and young toddlers. Falls from less than 3 to 5 feet, as well as down a flight of stairs, have been extensively studied and do not cause skull fractures or significant intracranial injury.

HEAD INJURIES: More than 50% of head injuries in young children are believed to be inflicted as the result of abuse. Head injuries are the most serious form of physical abuse and cause significant mortality and morbidity. The signs and symptoms of these injuries vary in type and degree. Children with head injuries are at the highest risk for cardiopulmonary arrest from altered mental status, increased intracranial pressure, and seizures. Typical head injuries include epidural/subdural hematomas, celphahematomas and intracranial injuries. Battle’s sign (bruising on the mastoid process behind the ears), raccoon eyes, or blood behind the tympanic membrane may be signs of basilar skull fracture, a serious head injury.

ABDOMINAL INJURIES: Although abdominal injury to the child is less common than skeletal injuries in abuse, 40% to 60% of abdominal injuries are fatal due to internal bleeding, most often caused by being punching or kicking. Abdominal bruising is often not seen, even with severe blows to the abdomen. Auscultation, performed before palpation, may reveal decreased or no bowel sounds if the child has sustained intraabdominal injury. Abdominal muscle rigidity may be noted on palpation.

All adults have the potential to abuse a child. Healthcare providers must recognize injuries suggestive of physical abuse. However, research indicates detection of child abuse and intervention is frequently missed by healthcare professionals. For example, abuse-related head trauma is missed more often in children under 6 months old. Abusive injuries were also missed more often in white children of two-parent families.

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GROWING UP WITH US...
Caring For Children

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Competency: Demonstrates Age-Specific Competency by correctly answering 9 out of 10 questions related to Physical Indicators of Child Abuse.

PHYSICAL INDICATORS OF CHILD ABUSE

1. Physical abuse always leaves observable signs of maltreatment.
   a. True
   b. False

2. The most frequent perpetrators of physical child abuse are:
   a. strangers.
   b. parents.
   c. family members other than parents.
   d. caregivers who are not family members.

3. Which of the following is highly suspicious of abuse in a young infant?
   a. The outline of a bite mark less than 3 cm long.
   b. Loop injuries on the thighs.
   c. Mongolian spots on a baby of Asian descent.
   d. A bald patch in the occipital area.

4. Long bone fractures in an infant is highly suggestive of child abuse.
   a. True
   b. False

5. Which skeletal injury is NOT typical of child abuse in a young child?
   a. Epiphyseal/metaphyseal chip fracture
   b. Posterior rib fractures
   c. Fracture of the clavicle
   d. Distal femur metaphyseal fracture
6. Fractures in infants are most suspicious because in this age group:
   a. accidents don’t occur.
   b. there is rapid ossification of the bone.
   c. the bone is porous with increased elasticity.
   d. the epiphyseal plate is weak.

7. The mother of a two year old, Megan, says, “I was trying to teach her what hot meant by briefly touching her fingers to the stove burner.” Which injury is consistent with this report?
   a. The pattern of an iron on Megan’s palm.
   b. Minor burns to the finger tips of Megan’s right hand.
   c. A line of demarcation, a glove-like burn, on Megan’s wrist.
   d. Burns patterned like an electrical burn on both of Megan’s hands.

8. Which of the following is true regarding suspicious abdominal injuries in a child abuse?
   a. Produce no significant blood loss.
   b. Result from being kicked or punched.
   c. Abdominal bruising will be evident.
   d. Occur from running into objects during play.

9. A 7 month old, unconscious, infant has suffered a depressed skull fracture. This is most indicative of:
   a. Rolling off an upholstered chair.
   b. Falling down a couple of carpeted stairs.
   c. An intentional blow to the skull.
   d. A congenital defect.

10. A 6 year old is brought in for treatment after crashing into bushes on his bike. Which injury is suspicious of maltreatment?
    a. Bruises in various stages of healing on his buttocks.
    b. Abrasions on the right arm, shoulder, and knee.
    c. A laceration on the right cheek.
    d. Redness and swelling of the right eye.