

EVALUATION FOR BLEEDING DISORDERS IN SUSPECTED CHILD ABUSE

CARE Morning Report

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HISTORY

- ▶ Medical history for other symptoms suggestive of bleeding disorders:
 - ▶ Epistaxis
 - ▶ Bleeding from umbilical stump
 - ▶ Bleeding after circumcision
 - ▶ Bleeding after dental procedures
 - ▶ i.e. response to challenges in hemostasis

HISTORY

▶ Family history

- ▶ Any history of abnormal bleeding, special attention to maternal menstrual/childbirth history, any need for transfusions in a family member
- ▶ Specific ethnicity with increased risk of inherited bleeding disorder (e.g. Amish)
- ▶ Family history of consanguinity

▶ Medication history

- ▶ Specifically because certain medications can interfere with the results of bleeding disorder work up

EXAM³

- ▶ Thorough exam including hydration status, growth parameters, dysmorphic features
- ▶ Exam the oropharynx for signs of gingival bleeding, trauma to the frenulum
- ▶ Examination of the entire skin surface
- ▶ Abdominal exam for hepatosplenomegaly
- ▶ Musculoskeletal exam for joint or skin hypermobility (Ehlers-Danlos), or bony deformity

EXAM¹

Bruising

- ▶ Any bruising in a non-mobile child requires an evaluation for abuse
- ▶ However, bruising in a young infant can also be the first presentation of a bleeding disorder
 - ▶ In these cases, simultaneous evaluation for bleeding disorder and abuse should be performed
- ▶ Think of bleeding disorder in a non-mobile infant when there is bruising or petechiae at areas of normal handling or pressure
 - ▶ Petechiae at clothing line pressure sites
 - ▶ Bruising in pattern of car seat fasteners
 - ▶ Excessive, diffuse bleeding



BRUISING (continued)

- ▶ When examining, look at:
 - ▶ History given to explain the bruising
 - ▶ Nature and location of the bruising
 - ▶ Certain bruising patterns have higher specificity for abuse: buttocks, ears, genitals
 - ▶ Mobility and developmental status of the child



BRUISING (continued)

- ▶ Bruising most concerning for child abuse:
 - ▶ Bruising in an infant that is not yet crawling or cruising
 - ▶ Patterned bruising
 - ▶ Positive imprint (like the shape of an object: i.e. shoe)
 - ▶ Negative imprint (such as the space between fingers in a hand print)
 - ▶ Bruises of different ages
 - ▶ However current literature does not support physicians ability to accurately date bruises based on their color due to the wide variety in bruises appearance and healing in different individuals³

BRUISING

- ▶ No need for bleeding disorder evaluation if:
 - ▶ Description of trauma explains the bruising sufficiently
 - ▶ Child or direct witness provides sufficient history
 - ▶ Abusive object or hand pattern is present



EXAM (continued)

Other non-traumatic exam findings that are mistaken for bruising:³

- ▶ Mongolian spots
- ▶ Striae
- ▶ Hemangiomas
- ▶ Nevi of Ito
- ▶ Cultural practices such as coining or cupping



EXAM

INTRACRANIAL HEMORRHAGE

- ▶ Any ICH in a non-mobile child is secondary to trauma
 - ▶ Birth trauma can result in ICH in newborns
- ▶ No real studies have been performed on specific findings or patterns of ICH or the presence of retinal hemorrhages comparing children with bleeding disorders vs abusive head trauma
- ▶ Bleeding disorders can cause ICH in any area of cranial vault
 - ▶ Up to 12% of kids/young adults with bleeding disorder will have ICH at some point

INTRACRANIAL HEMORRHAGE (continued)

- ▶ If ICH is present, a bleeding disorder work-up is likely warranted
 - ▶ Unless:
 - ▶ Witnessed/verifiable head trauma
 - ▶ Other findings consistent with abuse such as fractures, burns, internal abdominal trauma

INITIAL LABORATORY EVALUATION

Bruising:

- ▶ PT
- ▶ PTT
- ▶ VWF antigen
- ▶ VWF activity
- ▶ Factor VIII
- ▶ Factor IX
- ▶ CBC with platelets

ICH:

- ▶ PT
- ▶ PTT
- ▶ Factor VIII
- ▶ Factor IX
- ▶ CBC with platelets
- ▶ DIC panel (d-dimer, fibrinogen)
- ▶ (VWD unlikely to be cause of ICH)

INITIAL LABORATORY EVALUATION

- ▶ Most factor deficiencies are identified with PT and aPTT
- ▶ PFA-100 is used for platelet function disorders
- ▶ This evaluates for conditions with prevalence > 1/500,000 people
 - ▶ ITP, Factor deficiencies (except Factor XIII), Von Willebrand disease
 - ▶ Does not evaluate for extremely rare problems like Factor XIII, defects of fibrinogen, fibrinolytic defects or extremely rare platelet disorders like Glanzmann thrombocytopenia

PRACTICE PATTERNS²

- ▶ Study evaluated the differences in children with bruising as the primary clinical finding, as in regards to:
 - ▶ Referrals to child abuse pediatricians versus pediatric hematology
 - ▶ Evaluations and final diagnosis by hematologist or child abuse pediatrician
- ▶ Previous studies had demonstrated disparities with respect to race/ethnicity and socioeconomic status in referral patterns to Child Protective Services and medical providers
- ▶ Looked at patients who bruising as the primary finding, did not include patients with other bleeding manifestations, preexisting hematologic diagnosis or other exam findings concerning for physical abuse

DIFFERENCES IN EVALUATIONS

Hematologist

- ▶ Patients were more likely to have laboratory evaluations
- ▶ None of this subgroup <9 months had head CT or skeletal survey

Child Abuse Pediatrician

- ▶ In children <9 months, 90% had skeletal survey and 60% had head CT

CONCLUSIONS

- ▶ Social factors such as race/ethnicity, insurance status or primary language were not found to be a statistically significant factor in the referral process
- ▶ Four factors found to be independently associated with referral to child abuse pediatrician:
 - ▶ Bruises concerning for abuse
 - ▶ No family history of bleeding disorder
 - ▶ No prior labs obtained
 - ▶ Referral by a non-medical source

- ▶ In this study, hematologists never diagnosed child physical abuse or referred a child with bruising to a child abuse pediatrician, and did not complete a full work up in kids <9 months with bruising
 - ▶ Indicates that child abuse might not be on the radar of some pediatric hematologists.
- ▶ Child abuse pediatricians much less frequently performed coagulation testing
- ▶ Patients who were referred from child abuse pediatricians to hematologists and were found to have no bleeding disorder were often not referred back to child abuse pediatrician, despite bruising concerning for abuse
- ▶ Indicates that there is a lack of communication between child abuse pediatricians and hematologists, and cross-referrals or collaboration could be useful for more complete and integrative work-up

REFERENCES

- ▶ 1. Anderst JD, Carpenter SL, Abshire TC; Section on Hematology/Oncology and Committee on Child Abuse and Neglect of the American Academy of Pediatrics. Evaluation for bleeding disorders in suspected child abuse. *Pediatrics*. 2013;131:e1314-e1322.
- ▶ 2. Jackson, Miller, Moffatt, Carpenter, Sherman and Anderst. Bruising in Children: Practice Patterns of Pediatric Hematologists and Child Abuse Pediatricians. *Clinical Pediatrics*. 2014; 1-7.
- ▶ 3. Ward, Ornstein, et al. "The Medical Assessment of bruising in suspected child maltreatment cases: a clinical perspective." *Paediatric Child Health* 2013; 18 (8) 433-7.