GUIDELINE: ASSESSMENT OF BRUISING & BLEEDING IN CHILDREN

Reference: Bruising / Bleeding / NAI
Version No: 1

Applicable to: All children in whom there is concern regarding bruising / bleeding

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Current literature

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Disclaimer

These have been ratified at the Child Health Guideline Meeting, however clinical guidelines are guidelines only.
The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician.
If in doubt contact a senior colleague or expert.
Caution is advised when using guidelines after the review date.
Assessment of bruising

Differentiating ‘normal’ from ‘abnormal’ bruising requires careful documentation of history, examination and appropriate investigations. The aim of this guideline is to provide the information required in relation to these 3 important areas: the history and examination are as important as the investigations.

Bruising in non-mobile children is very uncommon occurring in <1% “if they don’t cruise they don’t bruise”; increasing proportionally with advancing developmental stage and mobility.

Much research has been done in trying to establish whether certain injuries are pathognomonic of NAI but this cannot be claimed with any certainty. Having said this there are patterns of bruising which are more suggestive of NAI including bruising over the face, ears and back of the body distant from bony prominences, multiple bruises occurring in clusters and of uniform shape, or those that carry the imprint of an object. It must be recognised however, that in a child with a severe underlying haemostatic disorder significant bruising may result from usual handling but also that these children can be abused.

History

a. Past medical history should include questions to consider bleeding disorders:

- Prolonged bleeding– ask about mode of delivery, any bruising or bleeding at birth or from the umbilical stump (a classic feature of factor XIII deficiency), haematoma after routine vitamin K injection, prolonged bleeding after Guthrie heel prick, trauma, or after surgery such as circumcision, tonsillectomy or tooth extraction;
- Epistaxis – frequency, duration (>30 mins), unilateral / bilateral, ENT interventions: (cauterisation, packing, surgery);
- Gingival or mucocutaneous bleeding – this is not necessarily bleeding on brushing teeth, but spontaneous bleeding / blood on the pillow 1st thing in the morning or bleeding following tooth eruption / dental extraction (suggests a defect in primary haemostasis such as a platelet abnormality or von Willebrand disease);
- Joint pain, swelling or reluctance to move a limb (suggestive of haemarthroses);
• Menorrhagia – is the menstrual cycle regular, how often are tampons / towels changed on heaviest days, history of flooding / anaemia;
• Poor wound healing, joint dislocations, hypermobility (suggestive of a connective tissue disease such as Ehlers-Danlos syndrome).

A wider medical history is also important, particularly to elicit any symptoms suggestive of bone marrow failure, thyroid dysfunction, malabsorption or other symptoms which may indicate an underlying pathological syndrome.

b. Drug history - Aspirin, NSAIDs, Warfarin, Heparin

c. Family history of bleeding disorder:

• It is insufficient only to ask if there is a family history of bleeding disorder; specifically ask about recurrent epistaxis, menorrhagia, bleeding following haemostatic challenge and in the perinatal period in family members;
• Haemophilia (30% may arise secondary to new mutations), Von Willebrand disease, platelet function defects;
• Consanguinity

Examination specific to bruising:

1. Number, distribution, site, colour, size, and pattern of bruises, petechiae and subcutaneous haematomata must be carefully recorded
2. Top to toe examination including mouth (oral or gingival lesions), behind ears and buttocks;
3. Abnormal scars, skin elasticity, joint hypermobility;
4. Pallor, lymphadenopathy, hepatosplenomegaly.

Documentation

1. Carefully and accurately describe and record cutaneous lesions, using body maps (contained within the medical proforma). Measure each lesion and its relationship to anatomical landmark, e.g. bony prominences;
2. Obtain clinical photographs. Note the date and time that photographs were taken;
3. Consider alternative light sourcing, e.g. UV illumination

Guideline for the assessment of bruising & bleeding in children
Haematological investigations

Indications:

1. Any child with unusual bruising or bleeding out of proportion to the injury sustained, including infants with subdural and / or retinal haemorrhage

2. Investigations are generally not indicated when the only bruising is clearly the result of a slap or blow with an instrument

3. Any indications in the history or examination of a bleeding disorder

Prior to taking the sample:

i) It is good practice to inform the haematology laboratory, after prior discussion with a haematologist, to ensure efficient handling of the samples and advice on the most appropriate tests

ii) Ensure that a full drug history has been taken and communicated to the haematologist so the effect of the drug on the test result and clinical picture can be accurately evaluated. (Check that the child has not been taking Warfarin, aspirin or NSAIDs during the previous 2 weeks)

Sample collection:

1. Atraumatic venepuncture where possible (stressed / tearful / anxious children have raised vWF levels and therefore these may be falsely elevated)

2. Blood taken from a cannula or central line can be unreliable because of heparin contamination

3. Avoid over or under filling specimen tube

4. The first line screen for coagulation screen, vWF and assays of FVIII & IX require a minimum of x2 blue capped citrate 1.3ml bottles (x3 if easy venesection).

5. Samples with clots in them will not be processed.

6. Separate bottles will be required for FBC and blood group.

7. Transport blood samples rapidly, ideally within 1 hour. First line tests can go in the chute / pod system

The reference ranges provided with all haematology blood results are adult reference ranges. To interpret the results, age appropriate normal ranges should be referred to.
A First line haematological investigations for bruising / suspected NAI

1. Full blood count and film (and mean platelet volume if thrombocytopenic)

2. Coagulation screen:
   - Prothrombin time (PT); not International Normalised ratio (INR)
   - Activated partial thromboplastin time (aPTT)
   - Fibrinogen (Clauss)

3a. Assays of Factor VIIIc, Factor IX, Von Willebrand factor (VWF antigen and VWF activity) and blood group
   - VWF activity levels less than 35iu/ml warrant further investigation
   - (note vWF levels will be falsely elevated if difficult venesection / child distressed)
   - Patient with mild factor VIII / IX deficiency may have normal APTT, but could suffer ICH after minimal head trauma

3b. A Factor XIII assay (or screen) should be undertaken for a child of any age with an unexplained intracranial haemorrhage. Results will not be available out of hours but samples can be sent and will be spun and frozen and processed on the next working week day

4. Blood group to interpret vWF levles

B Additional 1st line investigation

1. Platelet function analyser (PFA)-100 - If there is a history of
   - Excessive / unexpected bleeding following trauma / surgery / dental extraction
   - Gastrointestinal bleeding
   - Recurrent epistaxis – particularly if prolonged / requiring ENT intervention
   - Unexplained intracranial haemorrhage
   These require an additional x1 (prefer x2) blue capped 1.3ml citrate bottles, and MUST be walked to the lab. (Do not pod / use the chute system)

If any of the initial investigations are abnormal discuss result with haematologist in relation to significance and further investigations

Guideline for the assessment of bruising & bleeding in children
Second line investigations
If there is ongoing concern about a coagulation disorder being the cause of the child’s bleeding or bruising and all first line investigations are normal then rarer heritable causes of bleeding such as a coagulation factor deficiencies or a platelet function defect need to be considered in discussion with haematologist.

The special coagulation laboratory (02920 744732) at UHW can provide advice on which tests are available on transported samples, timing and techniques required as well as which tests require the child to be present and collected at UHW (e.g. platelet aggregation)

References
RCPCH Child protection Companion 2013

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