GUIDELINE

Thrombocytopenia

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this disclaimer

Contents

Aim

To provide guidance on the management of Thrombocytopenia

Risk

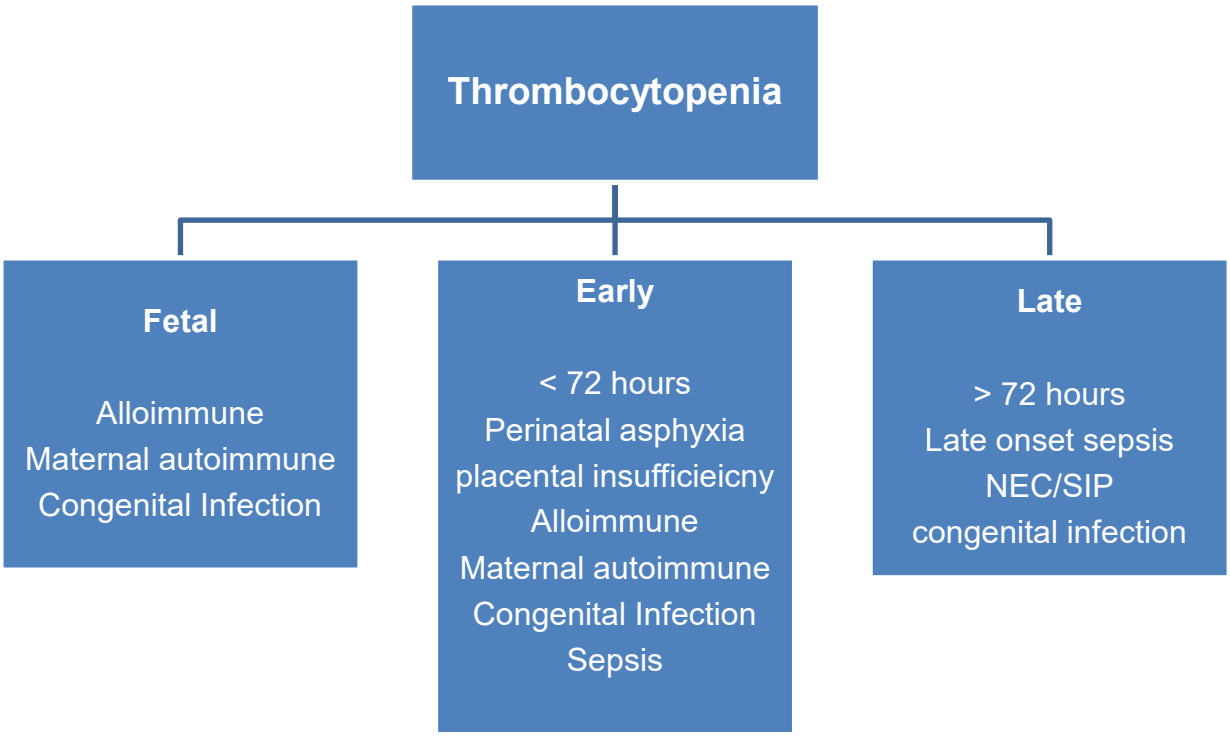
Failure to detect and diagnose thrombocytopenia can result in a delay in treatment or result in poor health outcomes.

Background

- 15% of neonatal patients have a thrombocytopenia of between 100-150,000. Counts below 50,000 should be considered for investigation.
- Bleeding may occur with trauma with platelet counts below 50-70,000. Spontaneous bleeding can occur with counts below 20,000. Infants with invasive lines and receiving intensive care procedures may need to be transfused with platelets earlier than well infants.
- Bleeding is more likely at any given thrombocytopenic level if the cause is decreased production or there is an associated platelet function defect.
- Platelet count may quickly drop over the first few days of life.
- Thrombocytopenia may last several weeks.

Causes

- Immune - Fetal and neonatal alloimmune thrombocytopenia (FNAIT), maternal immune thrombocytopenia (ITP, SLE).
- Infection: Bacterial infection, sepsis, viral infection (CMV and TORCH)
- NEC, DIC, hyper-viscosity, RDS, HIE, Placental insufficiency, Maternal Eclampsia.
- Congenital - Kassabach-Merritt Syndrome, Type 2b von Willebrand disease, trisomy 13, 18, 21, autosomal disorders.



Treatment

- Discuss with the haematologist on call who will review the blood film for the size of the platelets (larger platelets are usually younger platelets and indicates increased turnover rather than decreased production) and check with lab to look for any clots.
- Review maternal platelet count, history. Consider NAIT and type the parents' platelets. See below for further information on NAIT.
- If platelets <20,000-30,000 (well infant) or <50,000 (sick infant) transfuse CMV negative platelets (all platelets are now irradiated and collected with a filter, so washing is not required).
- If NAIT is likely (well infant and marked thrombocytopenia, request PLA1a negative platelets until the parents' platelet typing is known.
- In recently conducted multicentre trial involving preterm infants with severe thrombocytopenia, it was found that those who were randomly assigned to receive platelet transfusions at a threshold of 50,000 platelets had a higher rate of death or major bleeding within 28 days compared to those who received transfusions at a lower threshold of 25,000 platelets.
- Bone marrow analysis may be required in refractory thrombocytopenia and to look for rare congenital causes of thrombocytopenia.

Platelet Count ($x10^9$/L)	**Indication to trigger platelet transfusion in neonates**
<30	• Known or suspected fetal & neonatal alloimmune thrombocytopenia (NAIT) in term infant (PBM:6) • Stable term or preterm neonate with asymptomatic thrombocytopenia and no bleeding
30 – 50	• Preterm neonate with thrombocytopenia being treated for sepsis or requiring respiratory support
<50	• Known or suspected fetal & neonatal alloimmune thrombocytopenia (NAIT) in preterm infant (PBM:6) • Other sites of bleeding (excluding intracranial) • Term or preterm neonate with bleeding symptoms (mucocutaneous, gastrointestinal, petechiae/purpura), coagulopathy prior to surgery
<100	• Intracranial bleeding • Term or preterm neonate with major bleeding (drop in Hb requiring RBC transfusion) or those that require major surgery (e.g., neurosurgery)
Thresholds in platelet count at which transfusion is administered have been highly variable between individual units and clinicians.	

Feto-maternal or Neonatal Alloimmune Thrombocytopenia (NAIT)

- A rare but potentially serious condition that causes bleeding in the newborn is Feto-maternal or Neonatal Alloimmune Thrombocytopenia (FMAIT or NAIT). This condition is the platelet equivalent of haemolytic disease of the newborn.
- The fetus and newborn are at risk of thrombocytopenia and intracranial haemorrhage and bleeding in newborn. Untreated FNAIT is associated with a high rate of intra- cranial haemorrhage (~25%).
- NAIT is caused by maternal IgG alloantibodies against a fetal platelet specific alloantigen in the Human Platelet Antigen (HPA) system. There may or may not be a history of thrombocytopenia in a previous infant.
- **Incidence:** 1:2000 to 1:3000 live births among Caucasians. NAIT often (>60%) occurs during the first pregnancy.
    - 75% of cases in a Caucasian population are caused by anti-HPA-1a and 20% by anti-HPA-5b.
    - In oriental populations, anti-HPA-4b is more common than anti-HPA-1a.

Investigations

- Maternal serum is the test sample usually required for the investigation of possible NAIT. Usually, the mother's serum is tested against both panel cells from known HPA-typed donors and against platelets from the father.
- Currently the tests are done at FSH, and the details are given at under platelet antibody investigations. Complete the NAIT INVESTIGATION REQUEST (available from PathWest).
- Reactivity with only the father's platelets may indicate the presence of antibody directed to a low-incidence antigen.
- Antibodies to HLA antigens have also been reported to cause NAIT although the extent of their involvement is controversial.

MONDAY- FRIDAY - Always phone ahead to FSH to let them know a sample is being sent. Mark the sample as URGENT

FOR URGENT ADVICE PHONE 6152 8005.

Management of the neonate with known or suspected NAIT

ALWAYS DISCUSS WITH THE HAEMATOLOGIST ON CALL

- Urgent platelet transfusion should be given if platelets are below 30 × 10^9 /L in a term infant or below 50×10^9 /L in a preterm infant, even in the absence of clinically significant bleeding. **Platelet count response to transfusion should be checked within 6-12 hours.**

- When possible, compatible platelets should be on hand at the birth. Random donor platelets should be used if antigen-matched platelets are not immediately available. Continued use of random donor platelets is acceptable if antigen-matched platelets cannot be obtained. Because of short survival of random donor platelets, repeated transfusion is likely to be needed.
- If there is active bleeding, a higher threshold should be considered (100×10^9 /L for intracranial bleeding, and 50×10^9 /L for other sites of bleeding).

Immunoglobulin (IVIg) Therapy in the prevention or treatment of NAIT or haemorrhage.

Qualifying Criteria for IVIg Therapy

1. Evidence of thrombocytopenia <30 x 10^9/L in a neonate with NAIT or where a diagnosis of NAIT is highly suspected. OR,
2. Evidence of thrombocytopenia <30 x 10^9/L in offspring of a mother with ITP

   Occasionally more than one dose is required if thrombocytopenia persists**.** The aim should be to use the lowest dose possible that achieves the appropriate clinical outcome for each patient.

   - **Discuss with Haematologist prior to transfusion:** Immunoglobulin Products.
   - Need to register at the 'BloodStar' portal to get the IVIg, and NAIT is one of the conditions that has been preapproved.
   - Head ultrasound to look for any intracranial bleeding and targeted imaging depending on the clinical presentation.
   - My patient requires IVIg-SCIg_V9d (blood.gov.au) – link to the PDF which give the process to register and get the immunoglobulin.

Management of subsequent pregnancies

Parents need to know if subsequent pregnancies may result in a severely affected foetus requiring monitoring and treatment during their next pregnancy.

Subsequent pregnancies should be carefully monitored as there is a risk for in-utero bleeding.

On discharge - Send a letter to the GP mentioning the potential risk for future pregnancies.

Related CAHS internal policies, procedures and guidelines
Blood Components and Blood Products: Administration Neonatology Guidelines
Immunoglobulin Products WNHS Transfusion Medicine Protocol
Anaemia

References and related external legislation, policies, and guidelines

1. Curley A, Stanworth SJ, Willoughby K, Fustolo-Gunnink SF, Venkatesh V, Hudson C, Deary A, Hodge R, Hopkins V, Lopez Santamaria B, Mora A. Randomized trial of platelet-transfusion thresholds in neonates. New England Journal of Medicine. 2019 Jan 17;380(3):242-51.
2. Cremer M, Sallmon H, Kling PJ, Bührer C, Dame C. Thrombocytopenia and platelet transfusion in the neonate. InSeminars in Fetal and Neonatal Medicine 2016 Feb 1 (Vol. 21, No. 1, pp. 10-18). WB Saunders.
3. Stanworth SJ, Mumford AD. How I diagnose and treat neonatal thrombocytopenia. Blood, The Journal of the American Society of Hematology. 2023 Jun 1;141(22):2685-97.
4. Fetal-and-neonatal-alloimmune-thrombocytopenia(FNAIT)2017.pdf (blood.gov.au)
5. Ig Governance - Criteria for the clinical use of immunoglobulin in Australia (blood.gov.au)
6. Human platelet antigens | Lifeblood

This document can be made available in alternative formats on request.

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