
TRANSFUSION OF BLOOD PRODUCTS

Transfusions are a major part of supportive care of paediatric oncology patients.

Appropriate and careful use of blood products will enable patients to go through various stages of treatment for their malignancy.

Blood products available in PNG are: Packed Cells, Whole Blood and Platelet Concentrate. Fresh Frozen Plasma and Cryoprecipitate may only be available in Port Moresby.

A consent should be signed prior to the onset of transfusions, ideally at the beginning of therapy. This can cover all the transfusions that will be given during the course of chemotherapy

1. Red Blood Cells

- Anaemia is commonly seen in patients with cancer and may be seen at diagnosis.
- Defined as a haemoglobin level less than 10g/dL.

Anaemia may be due to:

1. Leukaemia
 - Excessive replacement of the normal bone marrow by leukemic blasts.
 - Bleeding secondary to low platelets.
 - DIC associated with acute pro-myelocytic AML (FAB M3), AML (M5), T Cell ALL.
2. Solid tumours
 - anaemia of chronic inflammation (Advanced Hodgkin's disease, Osteosarcoma)
 - Haemorrhage into tumours (large vascular tumours, necrotic tumours, liver tumours, germ cell tumours, neuroblastomas).
 - Decreased erythropoietin from widespread bony metastasis (neuroblastoma, Ewing's sarcoma, alveolar rhabdomyosarcoma).
3. Secondary to myelosuppressive chemotherapy.
4. Bone marrow suppression from – Septrin, CMV infection
5. Additional factors – Increased venepunctures, malnutrition.

Signs and symptoms

- Pallor, fatigue, irritability, anorexia, decreased activity, headaches, syncope, altered mental state(severe cases), signs of RHF (severe cases)

Transfusion

- Hb < 10g/dL in concomitantly thrombocytopenic patients or if invasive procedures planned or if symptomatic.
- Hb < 6 g/dL
- Amount to transfused (mls) = Hb deficit x weight (kg) x 4.
- Frusemide 0.5mls/kg stat IV. (Not to be given if transfusing to replace blood loss from bleeding).
- Packed cells should be given over 3-4 hours.
- Observations for fever and rashes.
 - Should there be fever or rashes;
 - Stop transfusion
 - Give Phenergan 0.5mg IMI stat
 - For fevers > 38 – Blood culture, MPS.
 - Commence anti malarias and consider broad spectrum antibiotics if malaria or sepsis suspected.

2. Platelets

Thrombocytopenia (PLT < 50 000) occurs in children with cancer due to;

1. Extensive bone marrow infiltration by malignant cells.
 2. Intensive chemotherapy or radiation
 3. Bone marrow suppression from Cotrimoxazole prophylaxis
 4. DIC from sepsis.
- * For surgical procedures, platelets have to be 100 000/microliter to ensure homeostasis and have to maintained at that level for at least 3 days post operatively.
 - * For invasive procedures like IDC etc., platelets have to be > 50 000microlitres.
 - * Platelets have to be more than 30 000 prior to lumbar punctures.
 - * Platelet transfusions are not needed prior to bone marrow aspiration and biopsy.

Transfusion

Platelets (mls) = 10mls/kg given over 2-3 hours.

Observations and treatment for fever and rashes as discussed in Red Cell transfusions.

3. Whole Blood

- Fresh whole blood may be used where there is no platelet concentrate and Fresh frozen plasma.
- Fresh whole blood contains; Red Cells, Platelets and Plasma.
- Fresh Whole blood (mls) = Hb Deficit x weight (kg) x 8.
- Lasix and Observations as in RBC guidelines.

**One has to be mindful though that for platelets the whole blood has to be unrefrigerated, and that the volume given is doubled that of a packed cell transfusion.*

4. Fresh Frozen Platelets (FFP)

- Each ml of FFP contains 1IU of each coagulation factor.
- Use in DIC, symptomatic L- Asparaginase induced coagulopathy, massive blood transfusions and liver synthetic dysfunction.
- Dose: 10-20mls/kg.

5. Cryoprecipitate

- Contains Factor VIII, Factor XIII and von Willebrand Factor.
- Dose: 1 bag/ 5-10kg of body weight. (1 bag = 40-60mls).

References

1. Carrol W 2010, *Cancer in Children and Adolescents*, Jones and Bartlett Publishers, India 2010.
2. Israelis T 2013, *Recommendations for Supportive Care in Low Income Settings, Pediatric Blood Cancer*, Vol 60:899-904, 2013.
3. Oussama A 2010, *Supportive Care in Paediatric Oncology*, Jones and Bartlett Publishers, India 2010.
4. Shann F, *Drug Doses 15 Edition* 2010.
5. Shann F 2003, *Paediatrics for Doctors in PNG*, PNG Department of Health Port Moresby 2003.