Ashford and St. Peter's Hospitals
NHS Foundation Trust

Guidelines for the management of a newly diagnosed child with ALL

Indication for use: Children aged 12months -18 years where there is clinical concern of ALL

Refer to the Supportive Care Guidelines

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Ratified by	
Date written	Dec 2018
Next Review	Jan 2022

New diagnosis of Leukaemia

Refer to the Haematology & Oncology Supportive Care Protocol

Leukaemia is a group of blood cancers which normally originate in the bone marrow leading to over-production of abnormal white cells (leucocytes) usually associated with under-production of other blood cells such as red blood cells, neutrophils and platelets. There are other conditions that present with similar symptoms and a raised number of white cells.

New onset of leukaemia may present with:

- Pallor
- Petechiae, purpura, mucosal bleeding
- Lymphadenopathy +/- hepatosplenomegaly (consider abdominal pain)
- Bone pain from overproduction of blood cells
- Lethargy, breathlessness, weight loss
- Fever, night sweats (lymphoma), frequent infections
- Cutaneous manifestations (leukaemia cutis). These lesions are variable and may include flesh–colored-to-violaceous papules, plaques, or nodules

Initial investigations

Firstly routine bloods should be sent including a blood film. If the film result is suspicious of leukaemia then the following samples should be sent and a CXR performed.
Bloods required: (4x purple EDTA, 2x yellow, 1x blue coagulation, blood culture, venous gas)
Chest x-ray: to look for a mediastinal mass

	- FBC + film - EDTA for Thiopurine methytransferase - TPMT (send to RMH) - 1x EDTA +/- blood film slides (send to RMH for morphology) - 1x EDTA for immunophenotyping (send to RMH)
	- U&Es/calcium/phosphate/urate *** Beware tumour lysis syndrome*** - LFTs - LDH - Serology for CMV, EBV, Hep A, Hep B (local)

Initial treatment

1. **Hyperhydration** 2L/m2. Consider if WCC >20x10^9/L. If high WCC >100x10^9/L consider 2.5-3L/m2 or if signs of TLS (tumour lysis syndrome)
2. **Allopurinol** 100mg/m2/dose orally 3 times per day. This dose is found in the Supportive Care Protocol. If at high risk of tumour lysis syndrome consider Rasburicase 0.2mg/kg IV over 30 mins OD. Rasburicase may not be available, if so start Allopurinol.
3. **Piperacillin + Tazobactam (Tazocin)** 90mg/kg QDS (max 4.5g per dose) and Gentamicin 7mg/kg OD (take pre 2nd dose level)

4. **Transfusions**
    a. Platelets 10ml/kg over 30 mins
    b. Packed red cells 5ml/kg initially over 3-4 hours, then repeat

    * Often anaemia and thrombocytopenia are present together. In this instance replace platelets first to avoid bleeding. Slowly replace packed red cells as these patients have become anaemic over a prolonged period.

Next steps

Discuss patient with attending consultant.
Discuss patient with the paediatric team at The Royal Marsden, Sutton (0208 642 6011)
The patient will be transferred over the following few days to either RMH or SGH where they may have an LP (lumbar puncture), bone marrow aspirate and a central line inserted whilst under one general anaesthetic if the diagnosis is clear.

Tumour lysis syndrome

Beware this complication seen when large numbers of abnormal white cells are killed (lysed) releasing their cell contents into the bloodstream. This is more likely to occur following the start of chemotherapy but can occur spontaneously in patients who have a very high WCC (WCC >50) and/or if there is bulky disease with multiple/large lymph nodes and hepato-splenomegaly.

It is characterised by a raised urate, phosphate and potassium with low calcium. To avoid the high levels of urate accumulating and damaging the kidneys these patients need hyperhydration of 2.5-3L/day and either Allopurinol or Rasburicase.