BACKGROUND

Febrile pediatric oncology patients are at risk for serious, potentially fatal infections. They are at serious risk of infection due to: 1) a low neutrophil count; 2) recent receipt of immunosuppressive chemotherapy (even if not neutropenic—the chemotherapy may suppress the number and/or function of lymphocytes); 3) presence of an indwelling central venous catheter (CVC). A rapid diagnostic workup and the rapid administration of empiric broad-spectrum antibiotics are critical to prevent serious infections in this patient population.

TARGET POPULATION AND INCLUSION CRITERIA

Pediatric oncology patients actively receiving chemotherapy and Hematopoietic Stem Cell Transplantation (HSCT) recipients. HSCT recipients are included until they are:

- a. at least 1 years status post transplantation, and
- b. off immunosuppression for at least 6 months (whichever occurs later).

DEFINITIONS

Fever: a temperature >38°C (100.4°F).

NOTE: Temperatures should not be taken rectally in pediatric oncology patients. A temperature by any other method or subjective (tactile) fever is acceptable for the definition of fever.

Neutropenia: an absolute neutrophil (ANC) count of <500/μL or an ANC of <1000/μL and expected to decrease due to the recent receipt of chemotherapy

Non-neutropenia: ANC >500/μL

NOTE: Neutrophil count is calculated by multiplying the total white blood cell count by the percentage of (neutrophils + bands). For example: WBC: 1,200/μL with differential: 10% neutrophils, 85% lymphocytes, 5% bands. ANC = 1200 * (10% + 5%) = 180/μL

DIAGNOSTIC EVALUATION (see also care algorithm)

1. Access the patient’s port-a-cath or external central venous catheter (CVC) (if applicable).
2. Obtain the following labs:
   a. CBC with differential
   b. Blood culture—from the patient’s central line
   c. Chemistry with BUN/Creatinine (Chem-10)
   d. Liver function tests
   e. CXR—only necessary in the presence of hypoxia or respiratory symptoms
3. Do NOT obtain a peripheral blood culture by venipuncture. Studies in pediatrics have not demonstrated that a peripheral blood culture changes management in this patient population. (However, if the staff cannot easily access the patient’s port obtain a peripheral blood culture and rapidly administer antibiotics through a peripheral IV. Access of the CVC should not delay the administration of antibiotics).
4. The following labs may be considered based on clinical presentation:
   a. Amylase/lipase.
   b. Urinalysis and urine culture—only in a symptomatic patient. Do not insert a urinary catheter into a potentially neutropenic patient. Obtain a clean catch or bagged specimen.
   c. Coagulation studies.
   d. Note: A lumbar puncture is very rarely indicated in a febrile pediatric oncology patient. A lumbar should NOT be performed without first discussing the case with the pediatric oncologist on call.
FEVER TO 38° C IN PEDIATRIC ONCOLOGY/HSCT PATIENT

Discuss with Pediatric Hematology Oncology Attending on Call
Floating Hospital: 617-636-5114 (page operator)

Rapid Initiation of Diagnostic Workup*:
1. Access port-a-cath or Broviac
2. Draw CBC with diff, Blood Culture, Chem-10, and LFTs
3. CXR indicated for hypoxia or respiratory symptoms

Suspected Neutropenia
(Absolute Neutrophil Count <500?)

Yes
Cefepime 50 mg/kg (max 2 grams) IV

NO
Ceftriaxone 50mg/kg (max 1 gram) IV

Unknown
Ceftriaxone 50mg/kg (max 1 gram) IV

*NOTES:
- Do not delay diagnostic workup and administration of antibiotics if having difficulty accessing port. If port cannot be accessed quickly—obtain peripheral access for diagnostic workup and the administration of antibiotics.
- Peripheral blood cultures are not needed if a blood culture has been obtained from the central venous catheter.
- Rapidly administer empiric antibiotics. Do not wait for the results of the labs/diagnostic workup.
- All pediatric oncology/HSCT patients with fever should receive IV antibiotics even if “well-appearing.”

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TREATMENT RECOMMENDATIONS (see also care algorithm)

- Administer broad-spectrum antibiotics as soon as the blood cultures and labs are obtained. Do NOT wait for the lab results to administer the antibiotic.
- Recommended broad-spectrum antibiotic is Cefepime (50 mg/kg/dose) (maximum 2 grams) to be given to all patients suspected of neutropenia.
- In septic appearing patients add Vancomycin (15 mg/kg/dose) and Gentamicin (2.5 mg/kg/dose) to the empiric treatment. See treatment algorithm.
- If the pediatric oncology attending physician does not suspect the patient to be neutropenic he/she may recommend administering Ceftriaxone (50mg/kg/dose) (maximum 1 gram). However, if the patient is subsequently found to be neutropenic a dose of cefepime can be given following the administration of ceftriaxone.
- Antibiotics (Ceftriaxone or Cefepime) are to be given to all pediatric oncology/HSCT patients who present with fever and a CVC even if they are “well appearing.” Administer IV fluids and other supportive medications as indicated by the patient’s clinical presentation.

ADMISSION CRITERIA

Always call to discuss with the attending pediatric oncologist on call (Floating Hospital for Children 617-636-5114).

1. All patients with fever and neutropenia should be admitted to the Floating Hospital for Children.
2. Patients with fever and non-neutropenia can be considered for discharge from the Emergency Department or office after the above described diagnostic workup has been completed and antibiotics have been administered if the following criteria are met:
   a. The child is well appearing with stable vital signs.
   b. The family is able to contact the on-call physician and return to the hospital immediately if the patient’s condition deteriorates.
   c. The family can bring the child to the clinic or the emergency department within 24 hours for a repeat evaluation.
   d. The pediatric oncology/HSCT attending physician on call is comfortable with managing the patient as an outpatient.

REFERENCES


Practice guidelines do not necessarily apply to every patient. A provider’s clinical judgment is essential. As always, clinicians are urged to document management strategies.

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