Supportive Care in Pediatric Oncology

Oncologic Emergencies and Management of Fever and Neutropenia

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KEYWORDS

• Oncologic emergencies • Fever • Neutropenia • Infection • Cancer
• Early signs of childhood cancer

KEY POINTS

- Children with fever and neutropenia are not a homogenous group. They can be stratified and therapy altered according to risk classification.
- Initial broad-spectrum monotherapy is recommended for children with fever and neutropenia. Therapy can then be tailored to each child based on culture results and clinical status.
- Hyperleukocytosis, tumor lysis syndrome, superior mediastinal syndrome, and spinal cord compression are among the most common oncologic emergencies seen at the time of diagnosis in children with cancer. Prompt recognition and management of these conditions is paramount to decreasing associated morbidity and mortality.

INTRODUCTION

Supportive Care in Pediatric Oncology

By current estimates greater than or equal to 80% of all children with cancer become long-term survivors. Thus, it is all the more important that the diagnosis of cancer should occur early in the course of the disease so that appropriate treatment can be initiated promptly. Delays in diagnosis may result in increased morbidity and mortality. However, such delays continue to occur in the present era of sophisticated laboratory and imaging studies. The most common reason for the delay in diagnosis is the continued stigma attached to the diagnosis of cancer/leukemia. Given current cure rates, pediatricians should not be reluctant to entertain cancer in the differential

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diagnosis of an ill child. Symptoms and signs specific to each cancer are discussed separately in this article. **Box 1** lists some presenting symptoms of leukemias and common solid tumors in children.

When leukemia and cancer are suspected, an orderly set of investigations helps in confirming or excluding the diagnosis of malignancy. Aside from a complete blood count, laboratory studies should include uric acid and lactate dehydrogenase levels along with electrolytes, creatinine, and blood urea nitrogen (BUN). A lactate dehydrogenase level coupled with high uric acid level requires exclusion of leukemia/lymphoma. Plain radiographs of the chest are invaluable for separating benign cervical adenopathy from mediastinal lymphoma with minimal cervical adenopathy. Plain films of the abdomen in children presenting with an abdominal mass might provide important clues of a possible neoplasm even if a mass is not easily noted (eg, punctate calcification in renal fossa may suggest neuroblastoma). An abnormal bowel pattern and signs of intestinal obstruction may indicate the presence of intestinal lymphoma (Burkitt lymphoma) and distinguish such cases from constipation from impacted feces in the colon. Advanced imaging studies such as MRI or computed tomography (CT) can then be used. For most tumors, other than anterior mediastinal masses, MRI is preferred rather than CT imaging because of better delineation of the anatomy and ability to combine imaging of the arterial system and venous invasion of the tumor. In children with neuroblastoma, MRI has the added benefit of imaging of dumbbell tumors with tumor extension into the vertebral canal. MRI is the preferred imaging study for bone tumors. For anterior mediastinal tumors, CT scans provide better estimates of the degree of compression of trachea and superior vena cava.

Improvements in supportive care over the last 2 decades have been among the contributors to the current high cure rates in childhood cancer. Further improvement in overall survival requires close attention to the prevention of disease-related early

Box 1
Common chief complaints in children with cancer

Chief Complaints	Possible Cancer
Petechiae, bruising/bleeding	Leukemia
Pallor and fatigue	Leukemia, NHL
Recurrent fever with bone pain	Leukemia, Ewing sarcoma
Bone pain	Leukemia, Ewing sarcoma, osteosarcoma, neuroblastoma
Limping	Bone tumors, leukemia, neuroblastoma
Proptosis	Leukemia, rhabdomyosarcoma, LCH, neuroblastoma
White dot in eye	Retinoblastoma
Swollen face and neck	T-ALL, NHL, Hodgkin lymphoma
Persistent adenopathy	Hodgkin lymphoma, NHL
Wheezing/orthopnea	T-ALL, Hodgkin lymphoma, NHL
Morning headache with vomiting	Brain tumors
Unsteadiness of gait	Brain tumors
Distended abdomen/with or without constipation	Neuroblastoma, Wilms tumor, Burkitt lymphoma, ovarian tumor, tumors arising from bladder, retroperitoneal tumors
Hematuria (painless)	Wilms tumor
Bleeding from vagina	Yolk sac tumor, rhabdomyosarcoma
Weight loss	Hodgkin lymphoma
Chronic ear drainage	LCH, rhabdomyosarcoma

Abbreviations: LCH, Langerhans cell histiocytosis; NHL, non-Hodgkin lymphoma; T-ALL, T-cell acute lymphoblastic leukemia.