

Pediatric Oncologic Emergencies

Tumor Lysis Syndrome

Life-threatening conditions may develop in children with cancer as a result of the malignancy and/or aggressive treatment modalities. Acute tumor lysis syndrome has hallmark metabolic abnormalities that are the direct result of rapid release of intracellular contents during the lysis of malignant cells. This typically occurs in patients with ALL or Burkitt lymphoma during the initial treatment period but may occur spontaneously before onset of therapy. Tumor lysis syndrome may also occur in other malignancies that have a large tumor burden, are very sensitive to chemotherapy, or have a rapid proliferative rate. The hallmark metabolic abnormalities of tumor lysis syndrome include hyperuricemia, hypocalcemia, hyperphosphatemia, and hyperkalemia. The crystallization of uric acid that can occur in cases of hyperuricemia can lead to obstructive nephropathy, tubular injury, acute renal failure, and death ([McCurdy and Shanholtz, 2012](#)).

Risk factors for development of tumor lysis syndrome include high white blood cell count at diagnosis, large tumor burden, sensitivity to chemotherapy, and high proliferative rate. In addition to the described metabolic abnormalities, children may develop a spectrum of clinical symptoms, including flank pain, lethargy, nausea and vomiting, muscle cramps, pruritus, tetany, and seizures.

Management of tumor lysis syndrome consists of early identification of patients at risk, prophylactic measures, and early interventions. Patients at risk for tumor lysis syndrome should have serum chemistries and urine pH monitored frequently, strict record of intake and output, and aggressive IV fluids. Medications to reduce uric acid formation and promote excretion of byproducts of purine metabolism, such as allopurinol, are often used. If tumor lysis syndrome occurs, IV hydration continues and the specific metabolic abnormalities are treated. Hyperuricemia is now effectively treated with recombinant urate oxidase, or rasburicase. This medication converts uric acid to allantoin, which is more soluble in urine. Exchange transfusions are sometimes necessary to reduce the metabolic consequences of massive tumor lysis, especially in children with a high tumor burden.