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## Metabolic emergencies in the pediatric oncology

The most common metabolic disorders in the pediatric oncology are tumor lysis syndrome, hypercalcemia and the syndrome of inappropriate secretion of antidiuretic hormone (SIADH). Tumor lysis syndrome is manifested with hyperkalemia, hyperuricemia, hypocalcemia and hyperphosphatemia. It is a result of substantial break down of tumor cells and renal failure, as a result of tubular precipitation of uric acid crystals. It may be present at the time of diagnosis, but it is more frequent in the first days of initial chemotherapy. Untreated tumor lysis may cause arrhythmias, convulsions, coma and DIC. Prevention is the mainstay of the treatment, aimed to decrease uric acid production, urine level of uric acid and urat formations. Hyperkalemia - the initial treatment is to discontinue all potassium intake. Negative potassium balance can be established by the use of ion exchange resins or hemodialysis. Hyperphosphatemia - Correction of hyperphosphatemia is usually sufficient for the correction of the hypocalcemia. Hypercalcemia is caused by bone resorption, ectopic parathormon, vitamin D or prostaglandins. The treatment includes: hydration and furosemide diuresis, calcitonin and corticosteroids. SIADH is a continual pituitary ADH secretion. The serum is hypoosmolar and osmolality of urine is inappropriately higher than of the serum. Renal and adrenal functions are normal. Immediate management is restriction of fluids. The authors presented their own experiences in treatment of metabolic disorders in children with neoplasms.

**Key words:** Tumor lysis syndrome; Metabolic disorders; Treatment

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## Percutaneous nephrostomy as the first line treatment of acute supravescical obstruction in patients with malignant disease

Acute supravescical obstruction may have various causes among which are malignant processes in the pelvic and retroperitoneal region. Acute obstruction can be the first sign of disease or the sign of disease progression, but also the complication of some therapeutic procedures such as surgery or irradiation. Acute urinary obstruction can be a life threatening condition if a patient has only one kidney or if both kidneys are affected by the process. Aim of this study was to retrospectively analyze the forms of malignant diseases which necessitated the placement of percutaneous nephrostomy (PCN) for the relief of acute supravescical obstruction. In a 2-year period (1999-2000), PCN was performed in 52 patients with malignant disease, 9 patients had solitary kidney while the others had both ureterorenal units affected. All patients had signs of acute supravescical retention with anuria and elevated BUN and creatinine and electrolyte disbalance. At our institution the main reason for PCN was TCC. In 9 patients with solitary kidney the obstruction was intracanalicular and in the extraureteral compression. Patients with both kidneys had bilateral obstruction as the result of massive bladder (35) or prostatic (3) tumor involving both ureterovesical junction, or post irradiation fibrosis of ureters and bladder (5). PCN is the procedure of choice for the treatment of patients with malignant disease provoking acute supravescical obstruction which can either make the patient fit for major surgery, or in inoperable cases can prolong patients life.

**Key words:** Supravescical obstruction; Percutaneous nephrostomy; Kidney



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## Pleural effusion in pediatric oncology as an emergency

Effusions are classified as exudate, transudate or chylous effusions. They are common in children with malignancies - non Hodgkin, Hodgkin, osteosarcoma, soft tissue sarcomas, Wilms tumor. Effusions developed as a consequence of affected diaphragm or below it, as well as due to secondary pleural deposits in adjacent tissues. Clinical signs are dyspnea, cough, chest pain, diminished breath sound, dullness on percussion over the affected area. Diagnostic procedures include chest X-ray and pleural needle aspiration. Aspirated fluid is evaluated for cytology (citospin) in order to identify malignant cells, as well as bacteriological, immunological, biological markers, proteins and total lipids. Thoracentesis is both diagnostic and palliative therapeutic procedure that ameliorates the symptoms. The procedure is followed by the treatment to prevent the recurrence of the effusion. The application of palliative procedures (sclerosing agents etc.) and pleurectomy or pericardiectomy are going to be discussed.

*Key words:* Pleural effusion; Thoracentesis; Treatment

## Bacterial infections in pediatric oncology patients

The child with a neoplastic disease may present with a critical infection at the time of diagnosis, particularly if the child has leukemia or lymphoma or if a normal barrier to infection has been disrupted. In patients with hematologic malignancies, the infections may be caused by Gram-positive or encapsulated Gram-negative organisms (e.g. *Streptococcus pneumoniae*, *Haemophilus influenzae* (because of the loss of both cellular and humoral immunity. If neutropenia is present, the etiology of the infection may also include opportunistic or enteric Gram-negative organisms, *Staphylococcus aureus* or *Staphylococcus epidermidis*. Management of the child with known malignancy who is admitted to the unit for a suspected bacterial infection or who develops one while in the unit, will largely depend on the presence or absence of neutropenia. In patients with neutropenia, the infection will often be due to common pathogens and need G-CSF. In the hospitalized neutropenic child, however, the etiologic agent may be *S. aureus* or *S. epidermidis*, or there may be mixed aerobic and anaerobic infection and fungal infections. Other factors such as prolonged antibiotic administration, the presence of indwelling catheters, poor oral hygiene or debilitation, and poor functional status before the onset of infection also increase the risk of several nosocomial infections. The authors show their own experiences.

*Key words:* Bacterial infections; Etiology; Treatment



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## Hematological urgent complications in pediatric oncology patients

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The hematologic disorders in question include hemorrhage, thrombosis and blast crisis. Hemorrhage is a second leading infection as a cause of death in children with leukemia and accounts about 14% of deaths. The causes of hemorrhage are thrombocytopenia, coagulopathy, or a combination of both. Thrombocytopenia may arise because of involvement of a bone marrow, myelosuppression due to chemotherapy and/or radiotherapy, or increased destruction of platelets by immune or nonimmune mechanisms. Several tumors may be associated with coagulopathies (e.g. promyelocytic leukemia, dysproteinemia), but these are not common in children. More commonly, a clotting disorder in children with neoplastic disease may result from chemotherapy administration, deficiency of vitamin K-dependent factors, liver failure or other conditions. In addition to tumor - and chemotherapy - related causes of hemorrhage, the child with neoplastic disease is at risk for many other conditions that predispose the hemorrhage (e.g. liver dysfunction, sepsis, etc.). The authors present their own experience from a single institution.

*Key words:* Haematologic complications; Thrombocytopenia; Coagulopathies