The Pathophysiology of Tumor Lysis Syndrome in Oncology Patients

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**The Pathophysiology of Tumor Lysis Syndrome in Oncology Patients**

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### Pregnancy

**Signs and Symptoms**

- Flank pain
- Those dehydrated at the start of chemotherapy, hyperuricemia, hyperphosphatemia, hyperkalemia, and hypocalcemia

**Pathophysiology**

TILS occurs as the result of tumor cell breakdown, usually after exposure to chemotherapy or radiation. When cancer cells are destroyed they release a large amount of intracellular contents into the extracellular space, including large amounts of uric acid. This may result in signs and symptoms of uric acid crystal formation in the renal tubules—a phenomenon known as acute uric acid nephropathy. Other characteristic signs and symptoms include:

- Gross hematuria
- Nausea
- Vomiting
- Diaphoresis
- Intestinal cramping
- Hypocalcemia will cause electrocardiogram (EKG) and neuromuscular changes such as:
  - Tachyarrhythmias
  - Irregular heart rhythms
  - Life-threatening arrhythmias
  - Neurovascular insufficiency
  - Muscle weakness

**Significance of Pathophysiology**

- The major side effects of hyperuricemia are those associated with uric acid crystal formation in the renal tubules causing intratubular obstruction, resulting in decreased serum calcium and release of intracellular contents into the patients’ extracellular space even before cell death itself. The major side effects of hyperuricemia are those associated with uric acid crystal formation in the renal tubules causing intratubular obstruction.

**Management of other dangerous electrolyte abnormalities**

- The importance of monitoring electrolyte abnormalities is key to prevent complications and death. It is important that nurses and physicians are aware of the common reasons for patients to receive treatment modalities (Table 2).

**Signs and Symptoms of Tumor Lysis Syndrome**

<table>
<thead>
<tr>
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### Conclusion

TILS is an oncological emergency and a major cause of morbidity and mortality in cancer patients (esp. children and world adults). TILS causes cell lysis before treatment and excessive renal uric acid, phosphorus, and nuclear acid in the general circulation. This can cause a reduced ability to excrete other electrolyte abnormalities within the blood that lead to increased risks for hyperuricemia, hyperphosphatemia, and hypocalcemia. TILS is challenging to manage in patients receiving conventional therapies, and there are no standard treatment modalities for managing TILS. Prevention is always the best approach, with prompt recognition and early intervention, and escalation of care when necessary.

**References**


**See Reference 1[12]**

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**Significance Cont.**

- Management of other dangerous electrolyte abnormalities is key to prevent complications and death. It is important that nurses and physicians are aware of the common reasons for patients to receive treatment modalities (Table 2).

**Implications for Nursing**

- Those at high risk should be placed on continuous cardiac monitoring [6].
- Electrolytes, renal function, and uric acid should be measured every 4-8 hours for high-risk individuals, and every 12 hours for those at intermediate to low risk [10].
- Recognizing signs and symptoms of acute renal failure is of paramount importance as escalating treatment modalities may be necessary and life-saving in these patients. Therefore, early recognition and prompt action are necessary to reduce complications associated with TILS.

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**See Reference 2[12]**

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**See Reference 3[12]**

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**See Reference 4[12]**

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**See Reference 5[12]**

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**See Reference 6[12]**

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**See Reference 7[12]**

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**See Reference 8[12]**

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**See Reference 9[12]**

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**See Reference 10[12]**

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**See Reference 11[12]**

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**See Reference 12[12]**