TUMOUR LYSIS SYNDROME (TLS)

Tumour lysis syndrome (TLS) is a result of the rapid release of intracellular metabolites:

1. Uric acid
2. Potassium
3. Phosphorous.

These metabolites are released in quantities exceeding the excretory capacity of the kidneys thus result in: hyperuricemia, hyperkalaemia, hypophosphatemia. Without intervention, the above will result in organ failure and death.

TLS is seen in tumours of large mass (Burkitts, ALL, AML, T cell ALL) with a high sensitivity to chemotherapy agent. Other high risk factors are; large abdominal disease, high LDH, a high pre-treatment uric acid level and low urine output.

TLS may be seen anytime from Day 1 of diagnosis to Day 5-7 of chemotherapy commencing.

Management of TLS is comprised of:

1. Prevention
2. Treatment.

The ideal treatment is PREVENTATIVE!

Prevention.

1. Hyper-hydration – ½ Normal Saline at 125mLs/m²/hour (3L/m²/day) aim for urine output of 3mLs/kg/hr. If this urine output is not achieved, increase fluids to 150mLs/kg/hr.
2. Allopurinol 10mg/kg/day TID. Commence 1 day prior to treatment and continue for 7 days.
3. Bloods twice daily: UEC, Ca, Mg, PO4, Uric Acid. Monitor for creatinine, hyperkalaemia, hypophosphatemia, hypocalcaemia.

The above should continue till UEC and electrolytes return to normal or tumour mass is down.

Treatment

1. Hyperkalaemia (K> 6.0 mEq/L)

   Signs and Symptoms:
   - Paralytic ileus, weakness, paralysis.
   - Potassium levels of 7.0- 7.5, ECG – QRS widening, peak T waves.
   - Without intervention, ventricular arrhythmias will result in death.
Management

- Stop any intake of Potassium.
- Arrhythmia –
  1. Calcium gluconate 10mg/kg IV
  2. Sodium Bicarbonate 1-2 mEq/kg IV
  3. Glucose 0.5g/kg/hr. with insulin 0.1 Units/kg/hr.

2. Hyperphosphatemia (PO4 > 6.5 mg/dL)
- Stop all phosphate intake
- Aluminium hydroxide 150mg/kg/day QID
- Keep urine output at 3mls/kg/hr.

3. Hypocalcaemia (< 1.5mEq/L)
- Occurs secondary to hyperphosphataemia.
- Symptoms: anorexia, vomiting, cramps, carpopedal spasms, tetany, seizures, alterations in consciousness or cardiac arrest.
- Calcium gluconate may be given only if severe symptoms of hypocalcaemia present, this should only be done after considering the level of serum phosphate.

4. Hyperuricaemia (10-15 mg/dL)
- Nonspecific signs: lethargy, nausea, vomiting, renal failure not seen till levels reach 20mg/dL.
- Allopurinol 300mg/m2/day TID
- Keep IV fluids as per protocol.

When conservative measures are ineffective in correcting electrolytes, dialysis may be considered.

References.

5. Oussama A 2010, Handbook of Supportive Care in Paediatric Oncology, Jones and Bartlett Publishers, Massachusetts 2010.