



## Clinical Pharmacology & Toxicology Pearl of the Week

### ~ Propofol-Related Infusion Syndrome (PRIS) ~

#### Mechanism of PRIS

- ✓ High doses of propofol (greater than 3mg/kg/h) lead to direct inhibition and uncoupling of mitochondrial electron transport chains, leading to greater reliance on anaerobic metabolism.
- ✓ Propofol also inhibits fatty acid metabolism, which leads to increased serum free fatty acids, hepatic steatosis & impaired lactate clearance.
- ✓ Muscle tissues are unable to metabolize fatty acids which leads to rhabdomyolysis



#### Clinical presentation

- ✓ Risk factors for the occurrence of PRIS include infusion rates > 4mg/kg/h, prolonged continuous infusion > 20-hours, carbohydrate depletion, catecholamine administration, severe stress, glucocorticoid use.
- ✓ The onset of PRIS can occur as early as following 20 hours of continuous propofol infusion
- ✓ The presence of metabolic acidosis is the most reported initial sign of PRIS

#### Diagnosis

- ✓ Diagnosis is based on a constellation of clinical suspicion and biochemical signs including:
  - Hyperlactatemia
  - Metabolic acidosis
  - Rhabdomyolysis
  - Hepatomegaly
  - Hypertriglyceridemia
  - Hyperkalemia and renal failure
- ✓ Dysrhythmias can occur with a Brugada-pattern on ECG defined by coved-type ST segment elevations in the precordial leads

#### Management

- ✓ Early recognition is key to appropriate management
- ✓ Once PRIS is suspected, immediate discontinuation of propofol infusion is necessary
- ✓ Any additional administration of triglycerides (eg. TPN) should be discontinued
- ✓ Supportive management is the mainstay of treatment of PRIS

#### Prognosis

- ✓ PRIS mortality is 35% despite withdrawal of propofol and maximal supportive therapy
- ✓ The presence of hyperthermia is a very poor prognostic factor and is associated with an increased risk of heart failure and sudden death.

#### References:

1. Mirrakhimov AE, Voore P, Halytsky O, Khan M, Ali AM. Propofol infusion syndrome in adults: a clinical update. *Crit Care Res Pract.* 2015;2015:260385

The Clinical Pharmacology (CP) physician consultation service is available Mon-Fri, 8am-5pm. The on-call physician is listed in ROCA on the AHS Insite page. CP consultations are also available through Netcare e-referral and Specialist Link. You can also find us in the [Alberta Referral Directory](#) (ARD) by searching "Pharmacology" from the ARD home page. Click [HERE](#) for more details about the service.

The Poison and Drug Information Service (PADIS) is available 24/7 for questions related to poisonings. Please call 1-800-332-1414 (AB and NWT) or 1-866-454-1212 (SK). Information about our outpatient Medical Toxicology Clinic can be found in [Alberta Referral Directory](#) (ARD) by searching "Toxicology" from the ARD home page.

More CPT Pearls of the Week can be found [HERE](#).

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