Levothyroxine: Implications for use in the brain dead organ donor

Brain death:

Brain death is linked to metabolic, endocrine, and hemodynamic disturbances that can have profound effects on the organ donor. During brain death there is a decrease in levels of thyroxine (T4). Consequently, energy stores are decreased and a shift from aerobic metabolism to anaerobic metabolism occurs. Furthermore, hemodynamic instability often ensues. This hemodynamic instability leads to the need for blood pressure support.

Hormonal therapy:

The LifeSource Levothroxine (T4) protocol is an important component of hemodynamic management in the organ donor patient. The goal of Levothyroxine infusion is to decrease vasopressor needs by creating better hemodynamic stability. Furthermore, preventing cardiovascular collapse and allowing for increased numbers of organs to be transplanted.

Implementing the protocol:

Prerequisites:

- Serum Potassium must be >3.5 prior to infusion.
- May implement T4 drip without premeds if K+ <3.5
- T4 should ONLY be mixed in NS due to stability.
- Have all medications prepared so can be given in a timely sequence.

1. Premedicate in rapid succession with the following prior to staring drip:
   - 1 amp D50 IVP
   - 2 gm Solumedrol IVP
   - 20 units Regular Insulin IVP
   - 20 mcg Levothyroxine IVP
2. Begin Levothyroxine drip (400mcg/500cc NS).
   Beginning dose for drip is 10mcg/hr.
3. Titrate drip q5-10mins increase by increments of 10mcg until goal dose of 50mcg/hr reached.
4. Titrate other vasopressors down as appropriate while maintaining blood pressure.

Medication Rationale:

Premedication with Solumedrol, insulin and Levothyroxine replace plasma cortisol, insulin, and T3/T4. D50 assists in the conversion of T4 to T3. Continuous Levothyroxine infusion provides constant levels of T4 which can then be converted to T3