**THYROID STORM**


**Take home points:**
1. Patients susceptible to developing thyroid storm have increased sensitivity to catecholamines. Therefore, any stressor that leads to outpouring of catecholamines, can lead to thyroid storm.
2. Thyroid storm is a true medical emergency; these patients should be managed in the ICU and beta-blockers should be started early (esmolol is a great choice because of its short half-life (on the order of seconds)).
3. Remember the “triangle of treatment”: decrease sympathetic outflow, decrease production of thyroid hormone, and decrease peripheral conversion of T4 to T3.

**Triggers:**
- Post-operative, radioactive iodine therapy, pregnancy (during child-birth), acute iodine load, uncontrolled diabetes, trauma, acute infection, severe drug reaction, myocardial infarction

**Clinical manifestations:**
- Characterized by marked hypermetabolism and excessive adrenergic response — *hyperthyroid to the max*
- Hyperpyrexia (fever) is the most reliable clinical finding
- Other symptoms: flushing, sweating, tachycardia, a-fib, high pulse pressure, occasionally heart failure, CNS (marked agitation, psychosis, restlessness, delirium, coma), GI (n/v, diarrhea, jaundice)
- Hypertension: may be present, but a normal or low BP does not rule out thyroid storm
- Remember that elderly patients often present atypically (apathetic thyroid storm)

**Pathophysiology:**
- There is no evidence that increased *production* of T3 or T4 causes thyroid storm
- Increased catecholamine receptors (increased sensitivity to catecholamines) plays a key role
- Decreased binding to TBG (increased free T3 or T4) may play a role
- **Bottom line:** patients who are susceptible to thyroid storm have increased sensitivity to catecholamines; therefore, in states of stress (= catecholamine excess), thyroid storm can rear its ugly head!

**Management:**
- All patients with thyroid storm should be managed in the ICU (high mortality)
- “Triangle of treatment”
  - Decrease the sympathetic outflow (beta-blockers – esmolol is a great choice)
  - Decrease production of thyroid hormone (PTU or methimazole); super-saturated iodine solution (SSKI) can also be used to block outflow of thyroid hormone from the thyroid gland.
  - Decrease peripheral conversion of T4 \(\rightarrow\) T3 (PTU, beta-blockers, steroids)