

EM Basic- Thyroid Emergencies

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The Thyroid (patho-phys review)

- Anterior neck, bi-lobed structure with an isthmus
- Usually mobile and non-tender
- Produces T3 and T4 (aka thyroid hormones)
 - T3 Active Form- regulates metabolism, growth and development
- Hormone production regulated by the hypothalamus, pituitary, and thyroid gland axis
 - Negative Feedback System
 - T3 and T4 are produced-> Negative feedback on hypothalamus and pituitary gland -> Less thyroid releasing hormone (TRH) and thyroid stimulating hormone (TSH) released -> Less T3 and T4 produced

History

- Personal or family history of thyroid issues? Malignancy?
- Enlarged thyroid gland?
- Hypothyroid Symptoms- everything is LOW- “slowed down”
 - Fatigue
 - Hair loss
 - Dry Skin
 - Constipation
 - Weight Gain

- Hyperthyroid Symptoms- everything is HIGH- “ramped up”
 - Palpitations
 - Heat intolerance
 - Anxiety
 - Sweating
 - Diarrhea

PEARL: Not all patients will have all these symptoms- presentations can be very subtle

Hypothyroid

- Primary hypothyroidism- failure to produce thyroid hormone
 - Hashimoto’s thyroiditis, prescriptions meds, iodine deficiency
- Secondary Hypothyroidism- not enough TRH or TSH produced due to issue with hypothalamus or pituitary gland

-Secondary hypothyroidism is much more rare- masses, ischemic events (Sheehan’s syndrome from post-partum hemorrhage)

Myxedema Coma- Hypothyroid problem

-Many causes- drugs, infections, medication non-compliance, CHF, trauma, bleeding, electrolyte imbalances- anything that can cause stress

Symptoms- everything is DOWN

- Hypoxia, decreased respiratory rate
- Hypothermia
- Bradycardia, heart blocks, abnormal EKG intervals
- Decreased mental status

“Classic case” is an elderly female “found down”

Myxedema management

-Careful attention to ABCs

-IV fluids, oxygen, cardiac monitoring.

-Labs

- CBC, CMP, TSH
- TSH will be HIGH

-Look for possible causes

-Medication changes? Infection/sepsis?

-T3 vs. T4

- T3 associated with more arrhythmias
- Most clinicians use T4- 200-500 mcg IV over 1 hour
 - Lower doses for patients with cardiac disease

-Steroids

- Dexamethasone 2-4mg IV every 6 hours OR
- Hydrocortisone 100mg every 8 hours

-Disposition

-Most go to ICU for close monitoring

Thyrotoxicosis- Hyperthyroid problem

-Causes- Grave's disease, multinodular goiter, subacute thyroiditis, OD on thyroid medication

-Also anything that causes stress- surgery, infection, drugs, pregnancy

-Symptoms- everything is UP

-Tachycardia

-Nausea/vomiting/diarrhea

-Hyperthermia

-Confusion/agitation (not apathetic like myxedema coma)

-Labs

-Same labs as myxedema- TSH will be LOW

Thyroid Storm management

-More complicated than myxedema coma

-Goals:

- 1) Provide supportive care and block the effects of thyroid hormone
- 2) Decrease production of thyroid hormone
- 3) Block release of thyroid hormone into peripheral circulation
- 4) Block peripheral conversion of thyroid hormone to active form
- 5) Find and treat precipitating cause if present

-Supportive care- IV fluids, oxygen, treat arrhythmias

-Propranolol- blocks effects of thyroid hormone and peripheral conversion of thyroid hormone

-1-2mg slow IV bolus every 10-15 minutes

-PTU or methimazole- decreases thyroid production

-PTU- 600-1,000mg PO initially, then 200-250mg PO every 4 hours

-Methimazole- 40mg PO initially, then 25mg every 4 hours

-Don't use methimazole in pregnant patients in first trimester

-Potassium Iodide or Lugol's solution- blocks release of thyroid hormone

-Potassium Iodide- 5 drops PO every 6 hours

-Lugol's solution- 8-10 drops PO every 6 hours

-Steroids- blocks peripheral conversion

-Hydrocortisone 100mg IV every 8 hours

-Dexamethasone 2mg IV every 6 hours

-Find and treat underlying causes

-Sepsis? Trauma? Medication OD?

Disposition- ICU for monitoring and continued treatment

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