Inpatient Endocrinology Pearls

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Disclosures

I am a consultant to:
Pfizer, Inc. on the topic of smoking cessation
Vivus, Inc. on the topics of weight management and sexual dysfunction (I am also a shareholder)
HealthEquityLabs.com on the topic of mobile health and disease prevention

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Inpatient Endocrine Pearls

Inpatient internal medicine physicians may be asked to treat ~12 endocrine emergencies.

Goals of presentation:
- Define an “endocrine emergency”
- Two illustrative case studies
- Work through the key “action steps” for the other endocrine emergencies
- Review overarching principles

What Causes an Endocrine Emergency?

- Rapid increase or lowering of a key hormone(s)
  - resulting in instability of pulse, blood pressure, fluid/electrolyte balance, respiration, and/or mentation
Endocrine Conditions that Require Urgent In-Hospital Consultation

First Six

- Diabetic ketoacidosis
- Diabetic hyperosmolar nonketotic coma
- Hypoglycemia
- Diabetes insipidus
- Pituitary apoplexy
- Addisonian crisis

Case Study 1

47-year-old man complaining of frequent headaches and bitemporal hemianopsia
Case Study 1

47-year-old man complaining of frequent headaches and bitemporal hemianopsia. He awakens one morning with an excruciating headache, nausea, dizziness, and double vision. He is brought to the ER with a BP of 80/50 and a right third-nerve palsy.

What is the diagnosis?

Pituitary Apoplexy

✧ Spontaneous hemorrhage into a pituitary tumor, leading to infarction
✧ Clinical symptoms:
  ✧ severe headache
  ✧ loss of vision
  ✧ cranial nerve deficits
  ✧ mental obtundation
  ✧ hypotension
  ✧ hyperthermia
✧ Biochemically: panhypopituitarism
Anatomy of the Cavernous Sinus

Oblique section through the cavernous sinus

Normal Pituitary MRI (T1 coronal)
Treatment of Pituitary Apoplexy

- Neurosurgery to evacuate clots and necrotic tissue
- Consider conservative medical treatment if there is no visual compromise
- Hormonal replacement
  - glucocorticoids: IV hydrocortisone 50-100 mg q6-8 h
  - mineralocorticoids:
    - not usually needed because zona glomerulosa, which makes aldosterone, is relatively ACTH independent
  - thyroid, gonadal steroids:
    - at your leisure
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Endocrine Conditions that Require Urgent In-Hospital Consultation

- Hypercalcemic crisis
- Hypocalcemic tetany
- Myxedema coma
- Thyroid storm
- Pheochromocytoma-induced hypertension
- Carcinoid crisis

Second Six

- Hypercalcemic crisis
- Hypocalcemic tetany
- Myxedema coma
- Thyroid storm
- Pheochromocytoma-induced hypertension
- Carcinoid crisis

Case Study 2:

A 26-year-old woman is brought to the ER with fever, tachycardia, and shortness of breath. Pulse in the ER is 160 and irregularly irregular. ECG shows atrial fibrillation with a rapid VR. BP is 160/50. T is 39.2 degrees C. There is a 2/6 systolic murmur at the base and no diastolic murmur.
Thyroid Storm

- Life-threatening exacerbation of hyperthyroid state leading to decompensation in one or more organ systems
- Incidence is rare: <10% of patients hospitalized for hyperthyroidism
- Mortality can be as high as 20% to 30%
- Most commonly seen in patients with underlying Graves’ disease
- Clinical presentation
  - tachycardia, atrial more than ventricular arrhythmias, systolic hypertension
  - fever
  - mental status change, from agitation to obtundation/coma
  - glucose intolerance, mild hypercalcemia

Thyrotoxic Stare vs. Thyroid Eye Disease (Graves’ Ophthalmopathy)
Measuring Orbital Protrusion

Luedde Exophthalmometer (~$30)

Hertel Exophthalmometer (~$300)

Burch and Wartofsky Criteria, Thyroid Storm

(Endocrinol Metab Clin North Am 1993; 22:263)

- Thermoregulatory dysfunction (severity of fever, up to 30 points)
- CNS dysfunction
  - Mild (agitation) – 10 points
  - Moderate (delirium, psychosis, lethargy) – 20 points
  - Severe (seizure, coma) – 30 points
- Heart rate
  - Degree of tachycardia – up to 25 points (HR ≥140)
  - Atrial fibrillation – additional 10 points
- Heart failure
  - Mild – 5 points; Moderate – 10 points; Severe – 15 points
- GI/hepatic dysfunction
  - Moderate (N/V/diarrhea/abdominal pain) – 10 points
  - Severe (unexplained jaundice) – 20 points
- Precipitant history (10 points, if positive)
  > 45 “suggestive”; 25-44 “supportive”; <25 “unlikely”
Thyroid Storm: Treatment

- Look for precipitating event
- Correct hyperthyroidism
  - PTU, methimazole
- Block release of preformed thyroid hormone
  - SSKI, lithium
- Inhibit peripheral conversion of T4 to T3
  - PTU, propranolol, glucocorticoids
- Decrease circulating hormone directly
  - plasmapheresis, charcoal plasma perfusion
- Definitive treatment
  - radioactive iodine, surgery

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Inpatient Endocrine Pearls: Take Home Points

Goals of presentation:

- Definition of an “endocrine emergency”
  Sudden change in endocrine hormone that causes instability of pulse, blood pressure, fluid/electrolyte balance, respiration, and/or mentation
- Two illustrative case studies
- Key “action steps” for the other endocrine emergencies
  Rapidly stabilize the vital that is disturbed
- Review overarching principles
  Few true emergencies that require immediate intervention
  You almost always have time to consult, look up answer

More Reading


Med Clin North Am 1995 (January issue)