**Academic Half Day – Endocrine Emergencies**

**Learner Guide**

Agenda:

1:10 – 1:20 pm Theory Burst

1:20 – 2:15 pm Small Groups: Case 1

2:15 – 2:30 pm Questions with the Expert

2:30 – 2:40 pm Break

2:40 – 3:20 pm Small Groups: Cases 2 & 3

3:20 – 3:30 pm Questions with the Expert

**Case 1**

A 65 yo man with HTN, CVA, and recent diagnosis of atrial fibrillation 2 months ago presents with 1 month of progressive generalized weakness and dizziness that is now affecting his ADLs. He has lost 10 lbs during this time. He has a history of tobacco use with a 40-pack year smoking history. He has a family history of lung cancer. He is taking warfarin, diltiazem ER, lisinopril, and simvastatin.

Brief exam: BP 84/60, irregular HR 105/min, appears generally fatigued and drowsy

Labs: Hgb 10.6, Na 131, K 5.0, INR of 7.3. UA negative nitrites and leuks CXR normal. Blood cultures are pending.

**What else do you want to look for on the exam?**

## **Discuss your diagnostic schema for shock. What general diagnoses are you considering and why?**

## **What are the different types of adrenal insufficiency? How will their clinical phenotypes differ?**

## **Explain the mechanism of hyperpigmentation, hyponatremia, and hyperkalemia in this patient. Based off these labs and physical exam findings, which type of adrenal insufficiency is he likely to have?**

## **What is the differential for the underlying cause of adrenal insufficiency?**

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| --- | --- |
| Primary AI | Central AI |
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1. **How will you make your diagnosis?**

## **Putting it all together. What would our patient’s labs/tests/clinical presentation look like?**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Type** | **Cortisol Level** | **Aldo level** | **Renin** | **ACTH** | **DHEA** | **Other** | **Cosyntropin Stim** |
| **Primary** |  |  |  |  |  |  |  |
| **Central** |  |  |  |  |  |  |  |

Our patient:

Serum ACTH: 245 (H)

Baseline serum cortisol: 0.4 ug/dL

Cosyntropin stim test: no response (probably not indicated given the significantly low cortisol level)

CT abdomen: bilateral adrenal hemorrhage, thought to be related to recent initiation of anticoagulation and supratherapeutic INR. No evidence of DIC, HIT, malignancy, embolic source.

## **But wait, I thought this was endocrine emergency half day! Why are we spending all this time on pathophysiology? You’re right – in these cases, stabilize the patient first and then start your work up. How will you treat this patient?**

## **Your patient is ready for discharge. What medications would you like to discharge him on for his adrenal insufficiency? Are there any important discharge instructions that you would like to educate him about?**

**Case 2**

A 31 yo female is seen in the ED for dizziness, tremors, and fatigue that started about 2 months prior. She delivered her first baby 5 months ago and states she is very sleep deprived. She is otherwise healthy and medical history is unremarkable. Her pregnancy was uneventful, and she did not have gestational diabetes. She is currently breastfeeding. She does note that she has felt slightly short of breath off and on for the past couple of weeks and has been having some colicky abdominal pain for a couple of months for which she underwent CT A/P to rule out nephrolithiasis. She told her PCP who ordered some tests last week but today was so dizzy she decided to go to the ED. She denies drugs, EtOH, tobacco use. Her only medication is prenatal vitamins.

Vitals: T 100.3, P 122, BP 118/74, RR 22, SpO2 99% on RA, Wt 120 lb (pre-baby weight)

Exam: in general, she appears alert, not in any acute distress. She has mild bilateral lid lag without conjunctival injection. She has a smooth enlarged thyroid without neck stiffness. She is tachycardic with a regular rhythm. No JVD, no edema. Lungs are clear. Abd is soft, nontender, no CVA tenderness. On neurologic exam, she is mentating normally, but has a fine tremor in bilateral UEs and has brisk DTRs.

## **What is your differential?**

1. **What if the patient is agitated with afib and crackles on exam? How would this change your differential?**

## **What could precipitate thyroid storm in this patient? What are other common triggers?**

## **Her TSH comes back undetectable. Free T4 is 2.8 (nl 0.9-2.4), and T3 225 (nl 70-195). Where would you like to admit this patient? Pretend you are inputting your orders into the computer. What medications would you like to start on this patient? *Try to remember as many as you can then refer to appendix number 5.***

## **Over the next several days, the patient’s symptoms improve drastically. She is afebrile, in normal sinus rhythm, and has no more signs of heart failure. She is tapered off glucocorticoids and maintained on methimazole. She asks you about the plan after discharge. You discuss:**

1. **What if she gets pregnant again?**

**Case 3**

A 71-year-old female with a history of HTN, HLD, DM2, depression, and low back pain is brought to the ER by her husband for AMS. She notes progressive fatigue over the past 4 months and reports she was recently diagnosed with depression by her PCP. He notes a 6 lb weight gain during this time. Over the past few days, she was having worsening difficulty rising from her chair and seemed “swollen.” She was seen at an outside ER and given low dose oxycodone to improve her pain. Over the past day, she is much more somnolent and disoriented, prompting the visit to the ER.

ROS: Positive for weight gain, fatigue, chronic constipation, mild exertional dyspnea that has progressed over the last 2 weeks, lower extremity swelling for 2 weeks as well. Difficulty ascending stairs. Mental status change as noted above. Negative for fever, chest pain, vomiting, blood in stools, focal weakness, numbness/tingling, seizures

Vitals: T 95.9, P 44, BP 90/60, R 10, Sat 94% RA

Exam: In general, she is somnolent, but arousable with verbal stimulation. Her head and neck are unremarkable. She is bradycardic, but regular rhythm. No JVD. Her lungs are clear aside from a few fine crackles at the bilateral bases. Her abd is NT/ND. 1+ bilateral lower extremity edema. No rashes.

1. **What are some diagnostic considerations and how would you work them up?**

Labs

Na 128, K 4.8, Cl 92, Bicarb 26, BUN 18, Cr 1.1, glucose 74

WBC 12, Hgb 10 (MCV 90), plt 300.

UA: Trace protein, negative LE/Nitrite

VBG: pH 7.25, pCO2 58

BNP: 50

CXR: Prominent pulmonary arteries, mild pulmonary edema, normal cardiac size

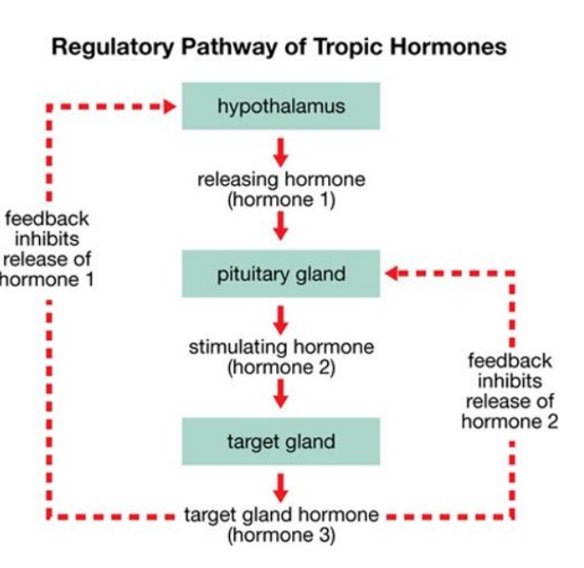
EKG: Sinus Bradycardia with 1st degree AV block PR 200, no concerning ST-T wave changes

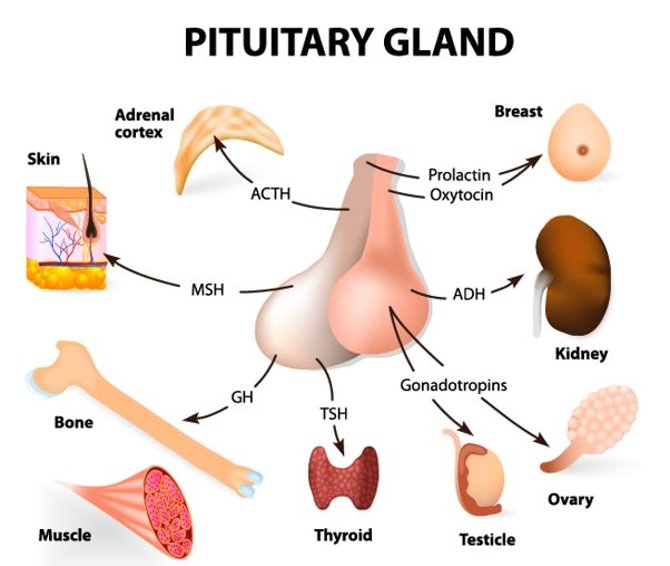
## **Based on her GCS and concerns about airway protection, she is intubated. She is started on broad spectrum antibiotics. Subsequently, she requires pressors for hypotension. She is persistently hypothermic and bradycardic. Her TSH returns at 130. Free T4 and T3 are pending. What is her diagnosis and most likely etiology?**

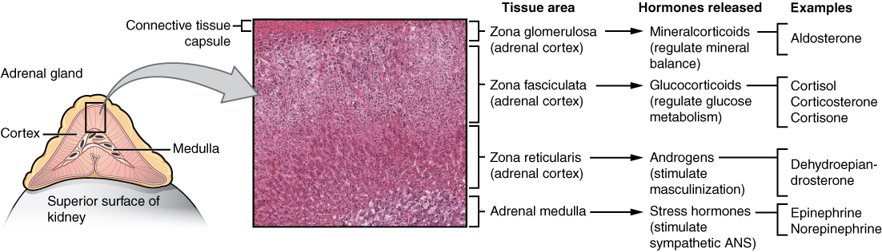
## **Why is this patient hyponatremic?**

## **FT4 returns undetectable. How do you manage her condition?**

**Appendix:**







Diagram

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