Thyroid Function for the Internist

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Objectives

- Recall the Hypothalamic–pituitary–thyroid axis
- Interpret function tests in a case based setting

Case 1)

A 32 YOF comes to your office complaining of sweating, palpitations, tremors. She works as a medical assistant and works long hours. She has lost about 10 lbs over the past 3 wks, but she states that this is intentional, and she has been dieting and exercising.

PMH: Mitral valve prolapse

Family History: Mother with hypothyroidism, daughter with Graves disease, s/p RAI ablation, now on levothyroxine
Meds: Daily multivitamin, denies supplements
Labs: TSH 0.03 FT4: 1.9 T3 Normal (6m ago, TSH 0.25 FT4 1.3)
Uptake Scan: Diffusely decreased uptake

Question 1)

A) Thyroiditis explains her low TSH. You can recheck TFTs in 6-8 wks.

B) She is hyperthyroid and uptake scan is low options for treatment include medical management and surgery.

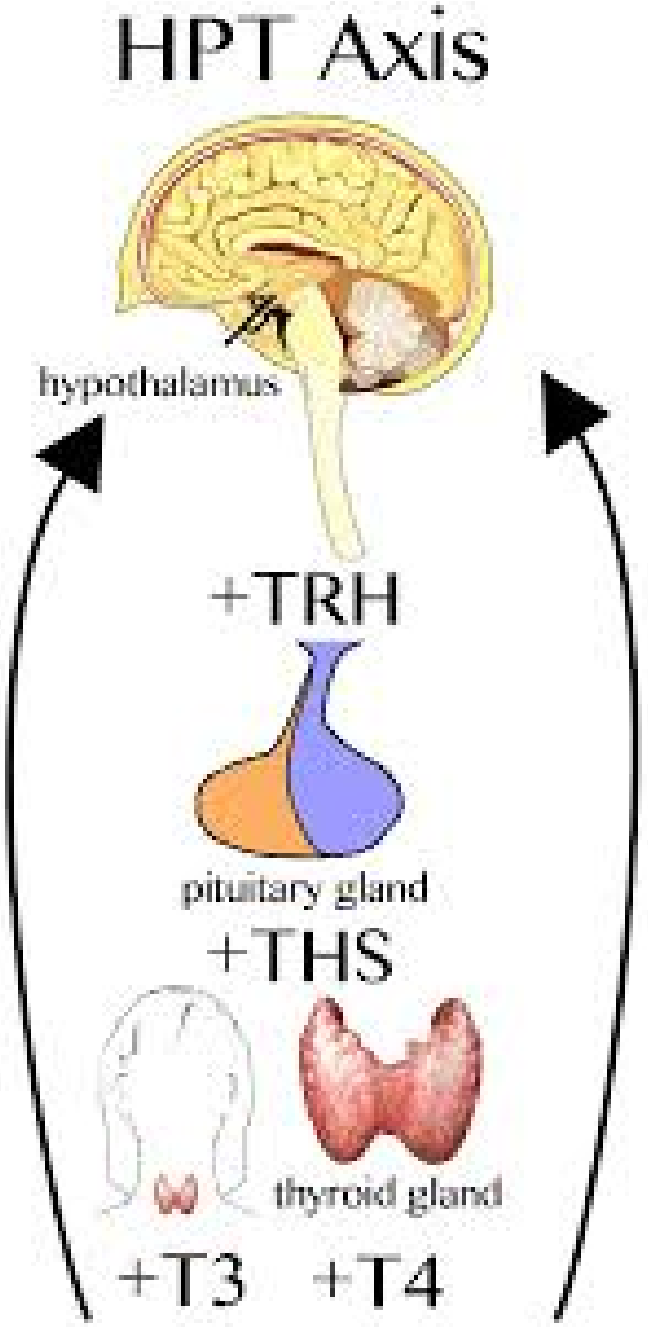
C) Discuss the pt's iodine intake with her because she must be taking in enough to result in decreased RAI uptake. This may also be the reason for her hyperthyroidism.

D) You suspect that the Pt is surreptitiously taking thyroid hormone.

E) The patient has a central process resulting in her abnormal TFTs.

Bonus: How do you prove it?

Hypothalamic–pituitary–thyroid axis



Case 2)

A 22 YOF who is 10 wks pregnant comes to you because thyroid function tests showed a normal TSH but an elevated T4. She is worried because the internet said she might be hyperthyroid. What do you do?

A) Check a thyroid uptake and scan to further evaluate

B) Repeat thyroid function tests including a FT4 and FT3.

C) Check a thyroid binding globulin.

D) Check thyroid antibodies.

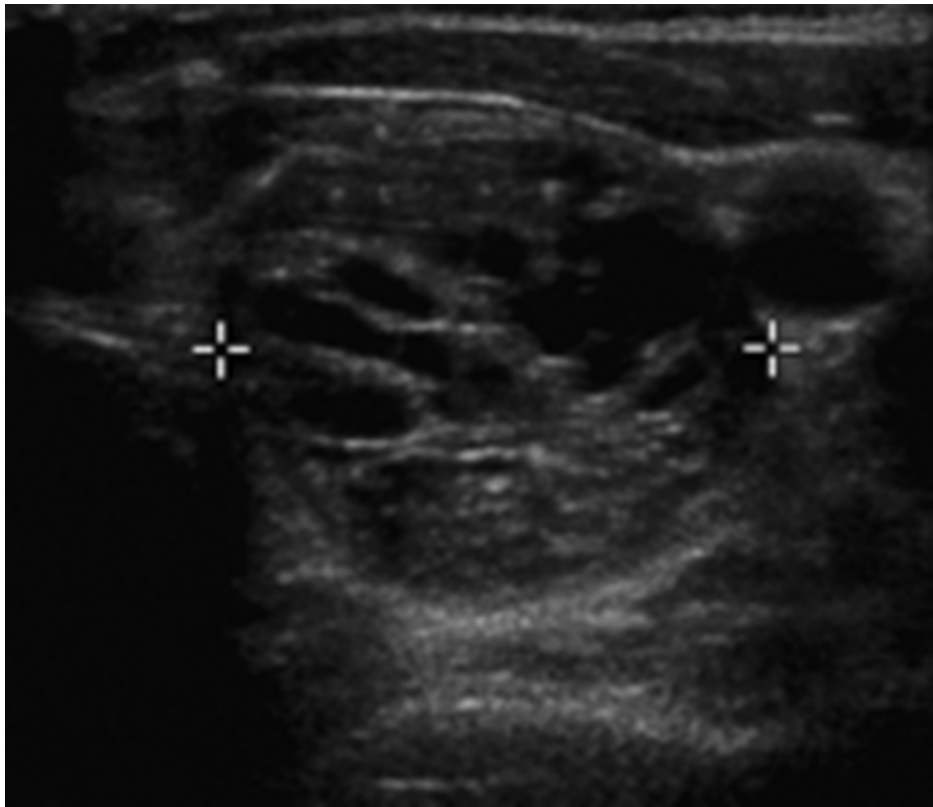
E) Tell the pt that it is normal to be slightly hyperthyroid in the first trimester of pregnancy due to hCG.

Bonus: If she were actually hyperthyroid, how would you treat?

Case 3)

- A 56 yo F is admitted for tachycardia and chest discomfort. She is on tele and is being ruled out for MI. A CT angiogram is negative for PE. A TSH, however, is undetectable with an elevated FT4 of 2.0. You think there might be nodules on thyroid exam.

- A thyroid ultrasound confirms the presence of a 2.5cm nodule with mixed echogenicity in the R lobe and a 2cm cystic nodule in the L lobe.



Question 3)

A) Thyroid uptake and scan.

B) Consult surgery for thyroidectomy.

C) Start beta blockers and methimazole.

D) US guided FNA biopsy of the largest thyroid nodule to rule out malignancy before deciding on treatment of the hyperthyroidism.

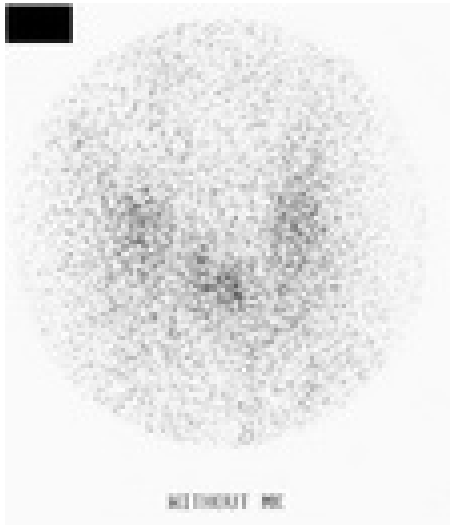
Case 4)

- Your 62 yo pt presented to the hospital with chest discomfort and palpitations.
- PMH: CAD s/p CABG, a fib, HTN, hyperlipidemia
- Meds:
- metoprolol 150mg bid
- Lisinopril 40mg qday
- Simvastatin 40mg qhs
- ASA 81 mg daily
- Amiodarone 200mg qday

EKG

Results

- An EKG reveals that your pt is in a fib with RVR.
- You check a TSH which is low at 0.2, with a FT4 of 1.8.
- A FT3 is high normal.
- A thyroid uptake and scan shows almost undetectable uptake.



Question 5)
Diagnosis: Thyrotoxicosis…. What next?

A) The thyrotoxicosis is due to the Amiodarone. Cardiology wants to start the pt on an amiodarone drip, but you argue that the treatment is actually stopping the amiodarone.

B) The treatment for this thyrotoxicosis is surgery, radioactive iodine, or anti-thyroid medication.

C) The treatment for this thyrotoxicosis is prednisone and methimazole.

D) You should repeat thyroid function tests in 6wks to determine if treatment is really needed.

Case 6)

You are asked to see a consult on WT6 for a pt with a low TSH of 0.4, a normal FT4. They are concerned that the pt's anxiety may be worsened by hyperthyroidism. The pt initially presented to the hospital with an overdose of benzodiazepines 1 wk ago, requiring an ICU stay and a couple of days on the medical floor prior to transfer to psych. Your student asked for a FT3 which is low normal.

A) Check a thyroid uptake and scan to further evaluate.

B) Order a reverse T3 level.

C) The low FT3 level means you should be treating with levothyroxine, which may help the pt's depression.

D) You should check TSH receptor antibodies to evaluate for Graves' disease.

E) There is no further treatment or evaluation required at this time

Sick Euthyroid!

- Also called non-thyroidal illness.
- Low to low normal TSH, a normal FT4, and a low FT3, but this can present with a variety of TFT abnormalities.
- Medications can also suppress TSH
  - Eg. corticosteroids, narcotics, dopamine,
- Psychiatric illnesses themselves can also result in abnormal thyroid function tests.

- Pearl: Without slam dunk symptoms, be cautious when interpreting TFTs on hospitalized patients.
  - Again as is often the case with endocrine questions, repeat the test!

Case 7)

- A 49 YO Male comes to you to establish care.
- PMH: HTN, DM2, hypothyroidism, hypogonadism, and obesity
- PSH: Resection of a pituitary macroadenoma many years ago, repair of a detached retina.
- Meds:
- Glyburide 5mg bid
- Metformin 1000mg bid
- Lisinopril 40mg daily
- Simvastatin 40mg qhs
- Levothyroxine 150mcg daily
- Androgel 1pkt daily

TFTS:

TSH 0.3

FT4 1.1

Question 7)

A) Pt is taking too much levothyroxine. Decrease dose to 125mcg daily and recheck TFTs in 6wks.

B) Order a thyroid uptake and scan to further evaluate for hyperthyroidism.

C) Recheck labs in 4-6wks and plan for further workup if TSH is again low.

D) Increase levothyroxine to 175mcg daily.

E) No further workup needed. Continue levothyroxine 150mcg daily.

TFTS:
TSH 0.3
FT4 1.1

Case 8)

- 60 year old veteran admitted to the hospital for heart failure; you checked his outpatient labs because he had missed his last appointment. HbA1C is 11. TSH 10.3 FT4 1.4. *What do you tell your attending on rounds?*

A) The TSH is elevated, so you need to increase his levothyroxine further.

B) You need to have another discussion with your patient about the importance of taking levothyroxine as directed.

C) The TSH and FT4 do not match up, so he may have a central hyperthyroidism.

D) He needs a pituitary MRI to evaluate for a TSH secreting pituitary adenoma.

E) He has developed a resistance to TSH explaining the high TSH result.

Case 9)

- Your 40 yr old patient with rheumatoid arthitis complains of fatigue and weight gain. She has no other symptoms of hyper or hypothyroidism, and she admits that she has been less active due to knee pain, and she has been taking her oxycodone on a regular basis as a result. Her rheumatologist has put her on a short course of prednisone to try to control her symptoms while they try to get approval for Enbrel. She has some osteopenia which you suspect is from multiple prior courses of corticosteroids.
- You check a TSH to rule out hypothyroidism, and it returns low at 0.4 with a FT4 of 1.0.
- Physical exam reveals a normal thyroid to palpation.
- She has no family history of thyroid disease.
- You then check a FT3 which is normal. Thyroid antibodies are all negative.

Question 9) Next?

A) The pt probably has subclinical hyperthyroidism and you should check a thyroid uptake and scan to further evaluate.

B) You plan to repeat thyroid function tests before the next appointment in a few months.

C) You should check a reverse T3 to see if her illness is resulting in an increased production of RT3 and that is why she is tired despite low TSH and normal FT4 and FT3.

D) She could benefit from a low dose of methimazole as subclinical hyperthyroidism can still result in decreased BMD and she already has osteopenia.

Case 10)

- A 40 yo F comes in for a follow up visit. She has no history of any thyroid disorders, but her mother had hypothyroidism. She reports no symptoms but brings labs from her naturopath, and she is very worried she has a thyroid problem.
- Meds: only vitamins
- Thyroid exam is normal. She has no eye findings.
- Heart rate is normal. She has no tremor.
- TSH 0.7
- FT4 1.3
- FT3 5.2 (2- 4.8)

Question 10) What's Happening?

A) She probably has hyperthyroidism with a T3 toxicosis only. This is unusual but does occur.

B) You suspect she is taking a supplement from the naturopath such as kelp which contains a lot of iodine, resulting in these lab findings.

C) You suspect that she has an antibody which is interfering with the lab test results.

D) You suspect that her naturopath has given her Nature throid or Armour thyroid.

E) She is recovering from an unnoticed thyroiditis.

Thank you!

- Special Thanks to Dr. Shinar & to Dr. Peckumn who I stole most of the slides from.