PBL
TEAMWORK
MED
433 Teams

Case 1: Can not tolerate hot weather

Learning issues:

- Anatomy & physiology of the thyroid gland .
- Formation of the thyroid hormones and their physiological actions .
- Pathology & pathogenesis of Graves disease .
- Use basic sciences to interpret the symptoms, signs & investigation results of a patient with Graves disease .
- Pharmacology of drugs used in Graves disease .
- Management goals & construct a management plan for a patient with Graves disease .

❖ Key information and Presenting problems:

- Safia, 29-year-old married Female accountant
- Always feels hot
- Sweats a lot
- Tremors in her hands
- Lost 6 kg in bodyweight

NEW TERMS	
Vitiligo	Autoimmune disease causes the skin to lose color
Exophthalmos	abnormal protrusion of the eyeball
Lid lagging	the immobility of the upper eyelid on downward rotation of the eye
Subjective fever	feeling hot without actual fever that can be measured by the thermometer

New problems and history:

- Last 7-8 months, she feel hot and she has excessive sweating all over her body and her hands are usually wet.
- Last 2 months, she has lost 6 kg in bodyweight despite the increasing of her appetite.
- Recently, she noticed tremor in her hands.
- She has palpitation (Heartbeats) even during rest.
- She also noticed changing in her bowel habits (diarrhea).
- Her husband noticed that she feels tired and under stress most of the time and loss her temper easily.
- Her menstrual periods are regular and her last menstrual period was 8 days ago (she is not pregnant).
- No past medical history or medication or allergy
- From family history, her mother have a vitiligo for 15 years.
- No family history of tremor.
- Social history : married for about 5 years ago and has one 3-year-old child.

Clinical examination

She looks anxious and thin (low BMI)

Vital signs

- High pulse rate
- High systolic pressure
- No fever (she has subjective fever)
- High respiratory rate (hyperventilation)

Eye examination

- Exophthalmos
- Lid lagging on looking down
- A white rim of sclera is seen above and below the cornea

Upper and Lower limb:

- Muscles of the shoulder and thighs are weak compared to distal muscles
- Tendon reflexes : bilaterally symmetrical and brisk (hyper-reflexity)

Skin and Hand examination

- Soft and warm skin
- Her outstretched hands show fine tremor
- Warm and wet palms

Neck examination:

- Swelling on the front of the neck which moves up on swallowing, diffusely smooth to palpation
- There is a bruit (abnormal sound) heard over the neck swelling.
- No palpable lymph nodes

Exophthalmos (bulging eyes)

Investigations:	
Blood test :	high T4, high T3, low TSH (primary hyperthyroidism)
Thyroid auto-antibodies:	raised TSH receptor IgG antibodies (TRAb)
Nuclear thyroid scan:	shows homogenous increased uptake of the radioactive iodine

❖ Diagnosis:

- **The most likely diagnosis is Grave's disease (autoimmune primary hyperthyroidism)**

❖ Management:

❑ **There are 3 options :**

1. **medical treatment**
2. **Surgical removal of the thyroid gland**
3. **Destroy the active cells of the thyroid by radioactive iodine**

✓ **In this case, the optimal option is <u>the medical treatment:</u>**

- **Propranolol (beta-blocker) 40mg/day → ameliorate symptoms that mimic over stimulation of the sympathetic nervous system.**
- **Carbimazole 10mg → block formation and secretion of the thyroxin from the thyroid gland.**

❖ Prognosis:

- **Over the next 4-6 months, she feels much better .**

INTERPRETATIONS OF THE PATIENT'S CLINICAL MANIFESTATION AND INVESTIGATION RESULTS :

Interpetation of signs and symptoms		
Item	**Change**	**Interpretation**
BMI	Decreased	Due to increased thyroxin secretion, which leads to increased BMR, and then weight loss
CVS	• Increased systolic pressure • Increased pulse rate • Increased respiration rate	Thyroid hormone increases cardiac output.
Hands	Warm & increase sweating	Increasing in metabolic rate will produce heat.
Eye	• Exophthalmos • Lid lagging on looking down • A white rim of sclera is seen above and below the cornea	Inflammatory tissues behind the eyeball
Interpretation of investigation		
Thyroxine & Tri-iodothyronin	Increase	In graves, excessive production of T4 & T3 and can't be stopped by the negative feedback mechanism
TSH	Low	Increasing in T3 & T4 will result in decreasing TSH as a negative feedback from hypothalamus and pituitary (intact hypothalamus & pituitary)
Thyroid scan	Increase uptake of radioactive iodine. The uptake is homogenous	Thyroid gland trying to synthesis more T3 & T4

Questions

Q1: Explain the general cause of the symptoms in this case?	**Q2: Why there is decreased level of TSH in our patient's blood?**
The symptoms related to increased secretion of a hormone known as thyroxin.	**Because there is increased level of thyroid hormones in the circulation which will send negative feedback to the pituitary and hypothalamus.**
Q3: What are the management options in this case?	**Q4: What is the management plan in this case?**
1. medical treatment 2. Surgical removal of the thyroid gland 3. Destroy the active cells of the thyroid by radioactive iodine	**Start medical treatment : • carbimazole : block the synthesis and secretion of thyroxin from the thyroid gland. • Propranolol : ameliorate the hypersympathetic symptoms such as palpitations, tremor, and anxiety**
Q5: What is medical terminology of excessive thyroid hormone secretion or function of thyroid gland?	**Q6: What is the cause of hyperthyroidism in this case?**
hyperthyroidism	**Grave's disease**
Q7: What is the laboratory testing for Grave's disease?	**Q8:What's the pathophysiology of Grave's Disease?**
Serum T4, Serum T3, Anti-thyroid antibodies, Sensitive serum TSH test	**Autoantibodies to the TSH receptor, which causes increased production and release T3/T4.**

Q9: Why she has Increased systolic pressure?	Q10: What is a Grave's specific clinical manifestation of hyperthyroidism?
Increased Thyroxin = cardiac output is increased	Exophthalmos
Q11: Why the patient has Exophthalmos?	**Q12: Explain the pathophysiology of the weight loss in this patient?**
Due to Inflamed and swollen of tissues and muscles of the eye, which leads to the protrusion of eyeballs	Due to increaesd thyroxin secretion, which leads to increased BMR, and then weight loss

Thank You ...

PBL TEAMWORK

Done by:

Fatimah AlQarni

Hanan AlDossari

Waad AlManie

Nada Bindawood

Noha almandiel

Ahmed Al-Hussien

Revised by:

Omar alDhasee , Alaa Alharbi

ME 433 Teams