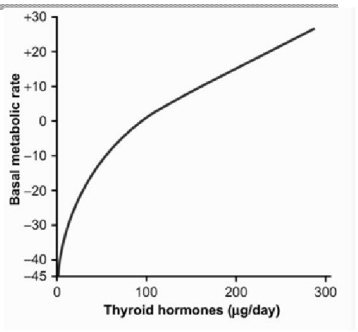
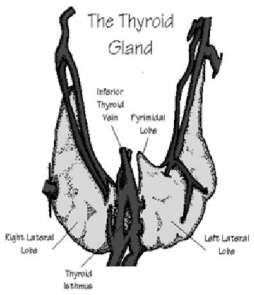
Thyroid Diseases

Medical Perspective

Effect of thyroid hormones of metabolism

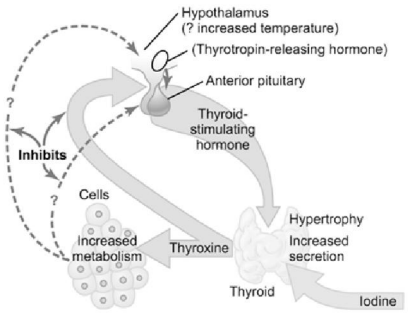


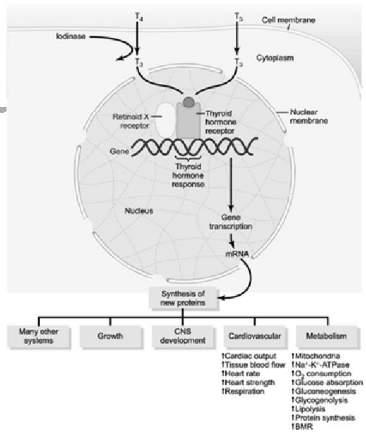
Aspects That Will Be Addressed



- Basic physiology
- Hyperthyroidism
- Hypothyroidism
- Thyroiditis

Regulation of thyroid hormone secretion





Hyperthyroidism

Hyperthyroidism Symptoms

- Hyperactivity/ irritability/ dysphoria
- Heat intolerance and sweating
- Palpitations
- Fatigue and weakness
- Weight loss with increase of appetite
- Diarrhoea
- Polyuria
- Oligomenorrhoea, loss of libido

Graves Disease

- Autoimmune disorder
- Ab^{s} directed against TSH receptor with intrinsic activity. Thyroid and fibroblasts
- Responsible for 60-80% of Thyrotoxicosis
- More common in women

Hyperthyroidism Signs

- Tachycardia (AF)
- Tremor
- Goiter
- Warm moist skin
- Proximal muscle weakness
- Lid retraction or lag
- Gynecomastia

Graves Disease Eye Signs

N - no signs or symptoms
O – only signs (lid retraction or lag) no symptoms
S – soft tissue involvement (peri-orbital oedema)
P – proptosis (>22 mm)(Hertl's test)
E – extra ocular muscle involvement (diplopia)
C – corneal involvement (keratitis)
S – sight loss (compression of the optic nerve)

Causes of Hyperthyroidism

Most common causes

- Graves disease
- Toxic multinodular goiter
- Autonomously functioning nodule

Rarer causes

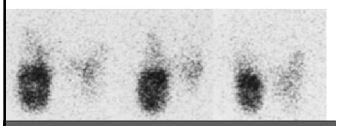
- Thyroiditis or other causes of destruction
- Thyrotoxicosis factitia
- Iodine excess (Jod-Basedow phenomenon)
- Struma ovarii
- Secondary causes (TSH or ßHCG)

Graves Disease Other Manifestations

- Pretibial mixoedema
- Thyroid acropachy
- Onycholysis
- Thyroid enlargement with a bruit frequently audible

Diagnosis of Graves Disease

Increased uptake of Radio marker - Graves



Autonomous functioning nodule

- TSH ↓, free T4 ↑
- Thyroid auto antibodies
- Nuclear thyroid scintigraphy (I_{123}, Te_{99})

Hypothyroidism Symptoms

- Tiredness and weakness
- Dry skin
- Feeling cold
- Hair loss
- Difficulty in concentrating and poor memory
- Constipation
- Weight gain with poor appetite
- Hoarse voice
- Menorrhagia, later oligo and amenorrhoea
- Paresthesias
- Impaired hearing

Treatment of Graves Disease

- Reduce thyroid hormone production or reduce the amount of thyroid tissue
  - Antithyroid drugs: propyl-thiouracil, carbimazole
  - Radioiodine
  - Subtotal thyroidectomy – relapse after antithyroid therapy, pregnancy, young people?
- Symptomatic treatment
  - Propranolol

Hypothyroidism Signs

- Dry skin, cool extremities
- Puffy face, hands and feet
- Delayed tendon reflex relaxation
- Carpal tunnel syndrome
- Bradycardia
- Diffuse alopecia
- Serous cavity effusions

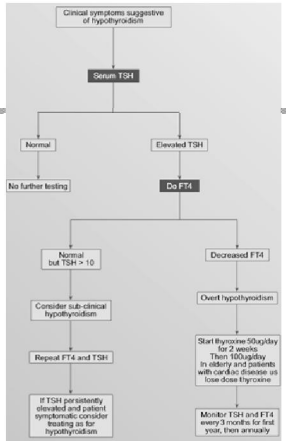
Hypothyroidism

Causes of Hypothyroidism

- Autoimmune hypothyroidism (Hashimoto's, atrophic thyroiditis)
- Iatrogenic (I_{123}treatment, thyroidectomy, external irradiation of the neck)
- Drugs: iodine excess, lithium, antithyroid drugs, etc
- Iodine deficiency
- Infiltrative disorders of the thyroid: amyloidosis, sarcoidosis,haemochromatosis, scleroderma

Lab Investigations of Hypothyroidism

- TSH ↑, free T4 ↓
- Ultrasound of thyroid – little value
- Thyroid scintigraphy – little value
- Anti thyroid antibodies – anti-TPO
- S-CK ↑, s-Chol ↑, s-Trigliseride ↑
- Normochromic or macrocytic anemia
- ECG: Bradycardia with small QRS complexes



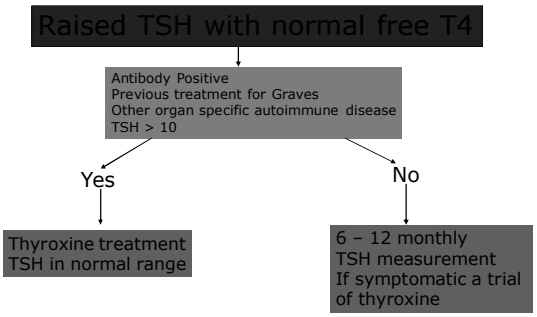
Treatment of Hypothyroidism

- Levo-thyroxine
  - If no residual thyroid function 1.5 µg/kg/day
  - Patients under age 60, without cardiac disease can be started on 50 – 100 µg/day. Dose adjusted according to TSH levels
  - In elderly especially those with CAD the starting dose should be much less (12.5 – 25 µg/day)

Euthyroid Sick Syndrome

- In patients with a systemic disease or starvation
- Alterations:
  - Decreased peripheral conversion of T4 to T3
  - Altered affinity to binding of Thyroid hormones to binding proteins
  - Reduced TSH release and loss of pulsatile secretion

Sub-clinical Hypothyroidism



Euthyroid Sick Syndrome Patterns

Increasing severity of disease

- Low T3, Normal T4, Normal TSH
  - Reduced peripheral conversion T4 to T3
- Low T3, Low T4 (normal free T4), Normal TSH
  - Reduced T4 binding to TBG
- Low T3, Low T4, Low TSH

Thyroiditis

Acute Thyroiditis

- Bacterial – Staph, Strep
- Fungal – Aspergillus, Candida, Histoplasma, Pneumocystis
- Radiation thyroiditis
- Amiodarone (acute/ sub acute)

Painful thyroid, ESR usually elevated, thyroid function normal

Thyroiditis

- Acute: rare and due to suppurative infection of the thyroid
- Sub acute: also termed de Quervains thyroiditis/ granulomatous thyroiditis – mostly viral origin
- Chronic thyroiditis: mostly autoimmune (Hashimoto's)

Sub Acute Thyroiditis

Viral (granulomatous) – Mumps, coxsackie, influenza, adeno and echoviruses

Mostly affects middle aged women, Three phases, painful enlarged thyroid, usually complete resolution

Rx: NSAIDS and glucocorticoids if necessary

Sub Acute Thyroiditis (cont)

Silent thyroiditis

No tenderness of thyroid

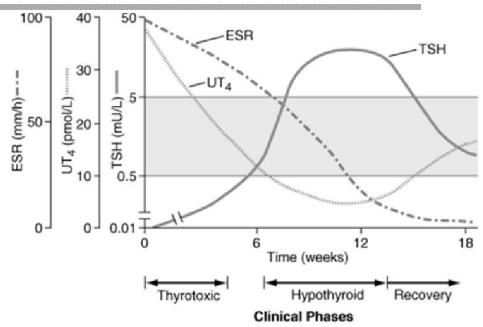
Occur mostly 3 – 6 months after pregnancy

3 phases: hyper⇒hypo⇒resolution, last 12 to 20 weeks

ESR normal, TPO Ab^{s} present

Usually no treatment necessary

Clinical Course of Sub Acute Thyroiditis



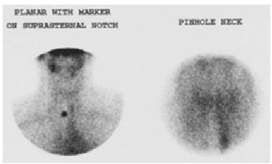
Last Comments

- Thyroid disease is the second most common endocrine disorder
- It is frequently diagnosed late
- A significant potential for abuse is possible, especially in weight loss programs. The long term effects of thyroxine can be harmful if not indicated
  - Osteoporosis
  - Accelerated atherosclerosis

Chronic Thyroiditis

Hashimoto's

- Autoimmune
- Initially goiter later very little thyroid tissue
- Rarely associated with pain
- Insidious onset and progression
- Most common cause of hypothyroidism
- TPO ab^s present (90 – 95%)



Chronic Thyroiditis

Reidel's

- Rare
- Middle aged women
- Insidious painless
- Symptoms due to compression
- Dense fibrosis develop
- Usually no thyroid function impairment