THYROID DISEASE

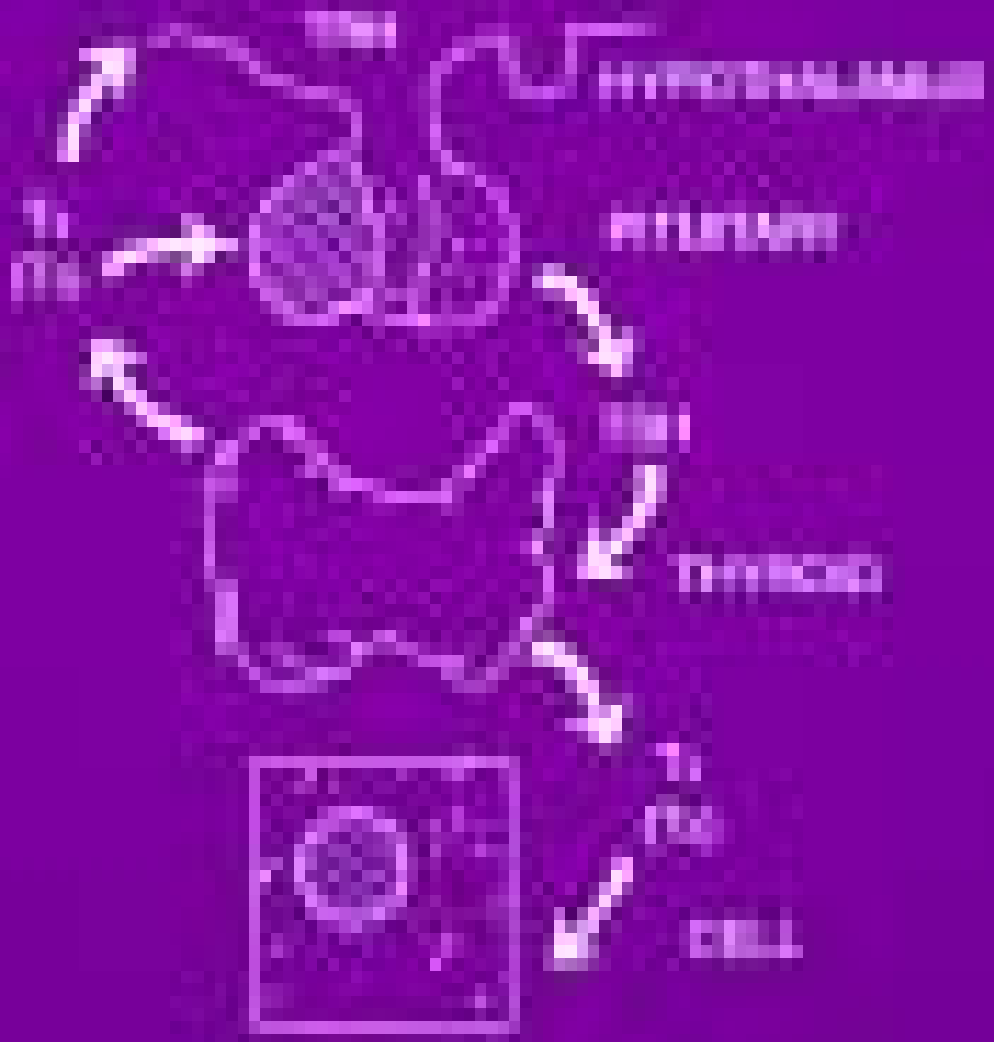
OUTLINE

- Regulation of Thyroid Hormone Production
- Common Tests to Evaluate the Thyroid
- Hyperthyroidism - Graves disease, toxic nodules, thyroiditis

OUTLINE

- Hypothyroidism - Hashimoto's thyroiditis, s/p surgery, s/p RAI tx
- Thyroid cancer - papillary, follicular, medullary, anaplastic

FEEDBACK CONTROL OF THYROID FUNCTION



COMMON TESTS TO EVALUATE THE THYROID

- Blood:
  - TSH
  - Free T4, T3 (rarely T4, T3U, FTI)
- Radiology:
  - Radionuclear - thyroid function vs. imaging
  - Other imaging: ultrasound, CT, MRI
- Pathology:
  - FNA biopsy

HYPERTHYROIDISM

- A clinical condition characterized by elevated levels of thyroid hormones in the blood
- Common causes of hyperthyroidism include Graves disease, toxic thyroid nodules, and thyroiditis

SYMPTOMS

- Nervousness, irritability, tremor
- Weight loss, fatigue, palpitations
- DOE, angina, muscle weakness

SYMPTOMS

- Frequent stools, heat intolerance, excessive sweating
- Insomnia, oligomenorrhea
- Vision change, eye irritation, diplopia

PHYSICAL FINDINGS

- Thyroid enlargement, tachycardia, tremor, increased DTRs
- Atrial fibrillation, CHF
- Proximal muscle weakness, clubbing

PHYSICAL FINDINGS

- Dermopathy: thickened skin with raised non-tender nodules over the anterior surfaces of the lower legs
- Ophthalmopathy: exophthalmos, lid lagophthalmoplegia, chemosis,conjunctivitis, altered visual acuity,corneal ulceration

GRAVES DISEASE

- The most common cause of hyperthyroidism
- Autoimmune disorder characterized by IgG antibodies to thyroid-stimulating hormone receptors on thyroid cells
- Etiology is unknown present in family members

GRAVES DISEASE

Occurs at any age, esp. in 3rd & 4th decades

- Women > men
- Other autoimmune conditions may be present in family members

GRAVES DISEASE

- Physical Signs

– hyperthyroidism

– “classic” triad: diffuse goiter, dermopathy, ophthalmopathy

GRAVES DISEASE

- Treatment

– beta blockers; calcium channel blockers

– radioactive iodine (? prednisone)

– ATDs (inhibition of thyroid hormonesynthesis)

– thyroidectomy goiter; otherwise, etiology is unknown

TOXIC NODULAR GOITER

- More common in the elderly than Graves disease
- Caused by multiple (most common) or a single hyper functioning thyroid nodule
- May develop in long standing simple goiter; otherwise, etiology is unknown

TOXIC NODULAR GOITER

- Physical signs– enlarged, nodular thyroid– hyperthyroidism

– CHF, arrythmias often present because of age group affected

– ophthalmopathy, dermopathy usually absent

TOXIC NODULAR GOITER

- Diagnostic Studies
  - decreased TSH
  - increased free T4/T3
  - RAIU and scintiscan
  - TSH receptor antibodies are absent

TOXIC NODULAR GOITER

- Treatment
  - radioactive iodine generally TOC
  - ATDs (inhibition of thyroid synthesis)
  - surgery

THYROIDITIS

- Inflammation of the thyroid gland may result in excessive release of thyroid hormone, resulting in thyrotoxicosis

THYROIDITIS - TYPES

- Common

– subacute painful (granulomatous)

– subacute painless (lymphocytic)

– Hashimoto's ("Hashitoxicosis")

- Other

– Postpartum thyroiditis

– Drug induced (lithium, interferon alpha, amiodarone, iodine)

– decreased TSH, increased free T4/T3

– increased ESR (> 50)

SUBACUTE PAINFUL THYROIDITIS

- Probably viral etiology; signs and sx often follow URI
- PE: nodular, tender, asymmetric thyroid
- Diagnostic studies

– decreased TSH, increased free T4/T3

– increased ESR (> 50)

– ***decreased*** RAIU

SUBACUTE PAINFUL THYROIDITIS

- Treatment

– beta blockers

– ASA

– NSAIDS

– corticosteroids

– rarely, replacement therapy

– ESR < 50

– ***decreased*** RAIU

SUBACUTE PAINLESS THYROIDITIS

- Autoimmune process
- PE: firm, non tender, symmetric, +/-enlarged thyroid
- Diagnostic studies
  - decreased TSH, increased free T4/T3
  - ESR < 50
  - ***decreased*** RAIU

SUBACUTE PAINLESS THYROIDITIS

- Treatment

– beta blockers

– replacement therapy as needed

HASHIMOTO'S THYROIDITIS

- Approximately 5% of patients present with hyperthyroidism
- PE, Diagnostic studies: see slides below
- Tx: beta blockers prn until controlled by natural course of disease

HYPOTHYROIDISM

- The clinical condition caused by failure of the thyroid gland to secrete adequate amounts of thyroid hormone
- Approximately 95% of cases are secondary to conditions directly affecting the thyroid gland, with the remaining 5% due to pituitary or hypothalamic cause

HYPOTHYROIDISM

- Approximately 1 in 5000 neonates
- Clinical manifestations in approximately 1% of population
- Females > males
- Increasing prevalence with age

SYMPTOMS

- Tiredness, fatigue, weakness
- Cold intolerance, hoarseness, dry skin
- Constipation, muscle cramps
- Mental impairment, depression

SYMPTOMS

- Menstrual disturbances, infertility
- Weight gain, median nerve disturbances
- Dyspnea, chest pain, peripheral edema
- Hair loss, facial edema, deafness

PHYSICAL FINDINGS

- Dry hair, dry skin, hair loss
- Deep voice, large tongue, deafness
- Thyromegaly, bradycardia, edema
- Pleural effusion, prolonged QT interval

PHYSICAL FINDINGS

- Psychiatric symptoms, somnolence
- Coma, respiratory depression
- CTS, hypercholesterolemia, ileus
- Hyperkeratosis of knees and elbows
- Sleep apnea

DIAGNOSTIC STUDIES

- Primary hypothyroidism is characterizedby decreased free T4 and elevated TSH
- Hypothyroidism secondary to hypothalamic or pituitary conditions shows decreased free T4 and normal or decreased TSH

DIAGNOSTIC STUDIES

- "Subclinical" hypothyroidism is characterized by absence of symptoms, normal free T4, and elevated TSH
- Antithyroid antibodies are elevated in autoimmune thyroiditis (Hashimoto's)

TREATMENT

- Levothyroxine

– beware of advanced age and heart disease

– effects of other medications

– re-evaluation at 8-week intervals until stable; thereafter every 6-12 months

CHRONIC AUTOIMMUNE THYROIDITIS (HASHIMOTO'S)

- Most common cause of hypothyroidism in adults
- Caused by antibodies to thyroid peroxidase (antimicrosomal [anti-TPO] antibodies) and thyroglobulin

CHRONIC AUTOIMMUNE THYROIDITIS (HASHIMOTO'S)

- Familial predisposition
- Females > males
- Typically between 30 - 50 years
- Usually detected upon routine exam or with complaints of enlarging goiter

CHRONIC AUTOIMMUNE THYROIDITIS (HASHIMOTO'S)

- Physical signs & symptoms: consistent with hypothyroidism
- Diagnostic studies

– usually demonstrate primary hypothyroidism (increased TSH; decreased free T4/T3)

– RAIU decreased

CHRONIC AUTOIMMUNE THYROIDITIS (HASHIMOTO'S)

- Diagnostic studies

– Antimicrosomal (anti-TPO) or antithyroglobulin antibodies present

– rarely demonstrate hyperthyroidism (see above slides for "Thyroiditis")

- Treatment

– levothyroxine

THYROID CANCER

- Papillary
- Follicular
- Medullary
- Anaplastic

THYROID CANCER

- Common at postmortem, but clinically important in only .004% of population
- 6 per million population die of TC
- Women > men
- Exposure to low-dose therapeutic radiation is major risk factor

THYROID CANCER

- 40% of patients who present with a thyroid nodule and hx of radiation exposure have thyroid cancer
- Living in an iodine-deficient or endemic goiter region is a risk factor
- Approximately 5% of solitary thyroid nodules in adults are cancerous
- Up to 21% of solitary thyroid nodules in children are cancerous

Thyroid Nodules – Risk Factors for Malignancy

- History of head and neck irradiation
- Rapid growth
- Symptoms of compression or invasion
- Pain
- Age < 20 years or > 60 years
- Male gender
- Family history of thyroid cancer, MEN, Cowden's Syndrome, Gardner's Syndrome

SYMPTOMS AND PE

- Single or multiple firm nodules
- Enlarged lymph nodes
- Hoarseness with vocal cord paralysis
- Back pain
- Other signs of distant metastases

DIAGNOSTIC STUDIES

- Thyroid function tests
- Fine-needle aspiration cytology
- Ultrasonography
- Nuclear medicine scans
- CT
- MRI

TREATMENT

- Thyroidectomy following identification of malignancy on FNAC

– extent has been based on several factors including type and grade of ca, size, patient age, extent of tumor; however, total thyroidectomy is now generally preferred

PAPILLARY CANCER

- Most common, up to 80% of cases
- Biphasic frequency, second & third decades and in the elderly
- Slow growing; metastasize via lymphatics
- Best prognosis

FOLLICULAR CANCER

- Approximately 15% of thyroid cancers
- Metastasizes hematogenously to lungs, bones, and other tissues
- More aggressive than papillary cancer
- Hurthle cell cancers are more aggressiveVariant

MEDULLARY CANCER

- Approximately 4% of thyroid cancers
- Often multifocal
- Consider MEN type 2; screening of family members may be warranted
- More aggressive than papillary or follicular cancer
- 50% five-year survival if untreated

ANAPLASTIC CANCER

- Approximately 1% of thyroid cancers
- Most aggressive type of thyroid cancer
- Worst prognosis, with five-year survival less than 5%

THE END