Problem 9 – Unit 6 – Clinical: Autoimmune Thyroiditis (Hashimoto thyroiditis)

- **Autoimmune thyroiditis**: it is an autoimmune disease in which antibodies will be produced against 3 major autoantigens in the thyroid gland:
  - **Thyroglobulin (Tg)** → thyroglobulin antibody (Tg Ab).
    (↑ iodine intake = Tg rich in iodine → more immunogenic and causing the disease).
  - **Thyroid peroxidase (TPO)** → thyroid peroxidase antibody (TPO Ab).
  - **TSH receptor** → TSH receptor antibody (TR Ab).

  Note: these circulating antibodies are useful markers to detect disease/abnormality related to the thyroid gland. In addition these auto-antibodies can:
  - ✓ Produce inflammation and destruction of thyroid tissue (ex. TPO AB) → leading to hypothyroidism (the thyroid gland is not capable to produce thyroid hormones "T3,T4" anymore).
  - ✓ May stimulate the TSH receptor (ex. TRAB or TSI) to cause thyrotoxicosis → leading to grave's disease (in which there is overproduction of thyroid hormones "T3,T4" by the thyroid gland leading to hyperthyroidism).
- Genetic factors predispose people to autoimmune diseases (autoimmune thyroiditis is an example). The most common cause is abnormalities related to MHC class-II molecule.
- T-cell immune mediated mechanisms are central to pathogenesis of thyroid disease (Hashimoto thyroiditis belongs to type-IV "T-cell-mediated" hypersensitivity).
- Higher prevalence of the disease among females at reproductive age (suggesting a link between female sex homones and the pathogenesis of autoimmune thyroiditis).
- Lithium which is used in psychiatric disease may precipitate autoimmune thyroid disease.

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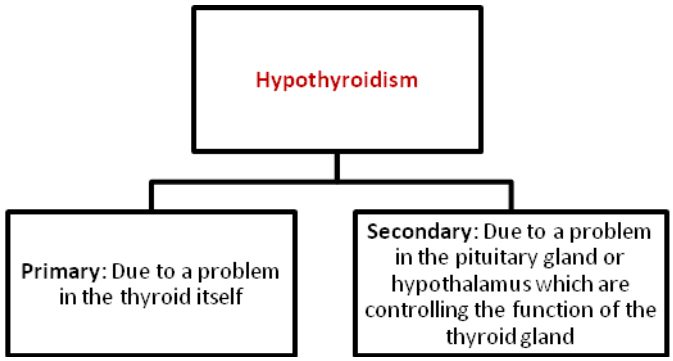
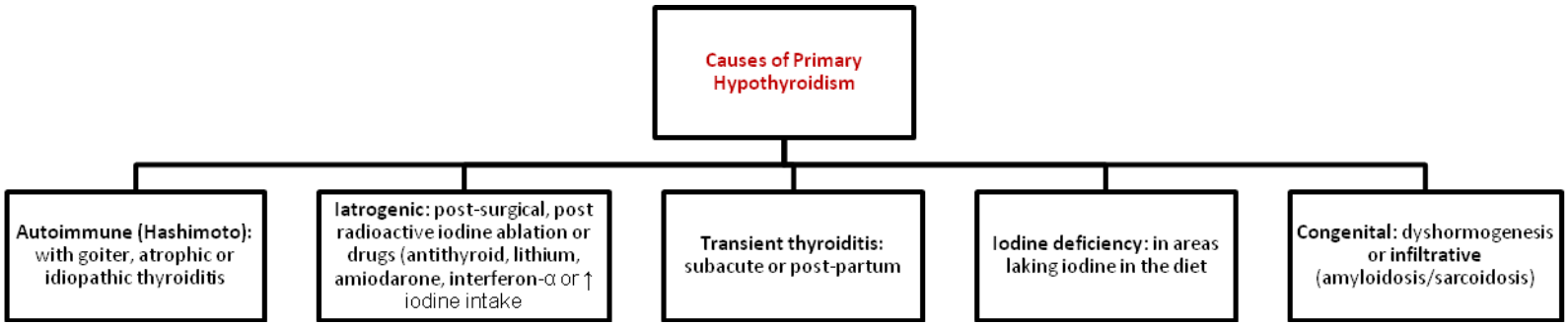
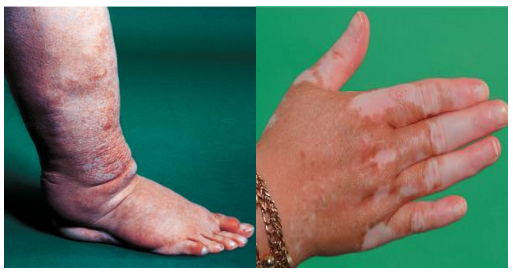




- **Signs and symptoms of hypothyroidism:**
  - **Signs**: hoarse voice, facial features, anemia, bradycardia (↓ cardiac output), ↑peripheral resistance, dermal myxedema (non-pitting edema due to deposition of glycosaminoglycans), pericardial and pleural effusions.
  - **Symptoms**: weight gain, cold-intolerance, fatigue, dry skin/hair, menorrhagia, constipation, depression, infertility and galactorrhea.



Dermal myxedema and vitiligo (also an autoimmune disease)

- **Laboratory abnormalities in hypothyroidism**:
  - **Specific**: TSH, fT3, fT4 (in primary hypothyroidism, both fT3 and fT4 will be reduced while TSH will be increased because there is no negative feedback. In secondary hypothyroidism, TSH will be reduced and therofore there will be no enough stimulation to the thyroid gland to secrete its hormones "T3 and T4").
  - **Autoantibodies**: thyroglobulin antibody and thyroid peroxidase antibody being the most common in (Hashimoto thyroiditis).
  - **Elevated serum enzymes**: CK, ALT and LDH.
  - **Hypercholesterolemia**.
  - **Anemia** (normochromic normocytic or macrocytic)
  - **Hyponatremia** (↓Na^+).
  - **Hyperhomocystemia**.

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- **Autoimmune thyroiditis:**
  - **Common in** women and can be **associated with** other autoimmune diseases (Addison's disease, type-I diabetes, vitiligo… etc).
  - **Characterized by** destructive infiltration of the thyroid gland with lymphocytes and plasma cells with varying degree of fibrosis.
  - There is thyroid **enlargement (goiter)** but not always found.
  - There is a higher risk of developing **thyroid lymphoma (B-cell lymphoma).**
  - **Positive for thyroid antibodies:**
    - ✓ *TPO AB*: in 90-100%
    - ✓ *Tg Ab*: in 80-90%
    - ✓ *TR Ab*: in 10% only.
  - **Presentation:**
    - ✓ 25% with hypothroidism (↑TSH and ↓fT3 & fT4).
    - ✓ Remainder are either euthyroid (normal TSH, fT3 and fT4) or have subclinical hypothyroidism (↑TSH with normal fT3 and fT4).
  - **Treatment**: WE ONLY TREAT THE HORMONE DEFICIENCY NOT AUTOIMMUNITY. Replace the deficienct thyroxine:
    - ✓ Start with full dose in young adults.
    - ✓ In elderly or those with cardiac disease, you have to start with a low dose and then increase it gradually while monitoring the patient.
    - ✓ Thyroid function test (TSH being the most important) must be repeated 6 weeks after initiation of therapy to adjust the dose.
      Note: for more detailed information, please refer to pharmacology note.