

Oral medicine

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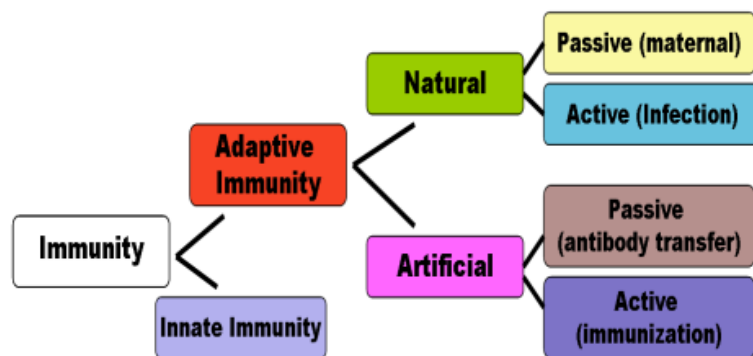
Autoimmune diseases

Immunity : Is the ability of an organism to resist infections .

It is divided into :-

A- Innate immunity

B – Adaptive (acquired) immunity Ab development to destroy Ag



Bacteria and virus (Ag): are soluble proteins introduced into the host cell and stimulate reticuloendothelial system (spleen, lymph nodes, bone marrow) to produce Ab

Anti bodies (Ab): are altered serum globulin molecules when brought in contact with protein or microbes (i.e. Antigen) their production would be excited.

The Ag may be destroyed by :

Agglutination, Precipitation, Lyses, Neutralization, Production of phagocytosis

Autoimmunity

- Auto or Self antigens
 - Antigens present in ones own cells
 - Altered by the action of bacteria, viruses, chemicals or drugs as a non-self

- Auto antibody
 - Altered cell (Auto Ag) - elicits the productions of Antibody
- Auto Immunity (auto allergy)
 - Immune response of auto Ab against self Ag
 - Humoral or cell mediated immune response against the constitute's of the body's own tissues.
 - There are more than 80 different kinds of diseases caused by autoimmunity.

Autoimmune diseases is a group of disorders in which tissue injury is caused by humoral (**by auto-antibodies**) or cell mediated immune response (**by auto-reactive T cells**) to self antigens. Normally, the immune system **does not attack the self**, the attack can be directed either against a very specific tissue or to a large no. of tissues. Once started, autoimmune diseases are hard to stop.

Causes

1. Sequestered or Hidden antigens which are not accessible to the immune system.

E.g. Lens Ag, Sperm Ag & Thyroglubulin.

2. Neo antigens: Altered or Modified Antigens – by physical (irradiation), chemical (drugs) or microbial agents (intracellular viruses)

3. Cessation of Tolerance: It may result when tolerance to the self-Ag is reduced.

4. Cross reacting Antigens: A foreign Ag which resembles self

5. Loss of Immunoregulation: over or under activity of T and B- cells

Classification

They are classified into 3 groups

1. Haemolytic autoimmune diseases

2. Localised autoimmune diseases

3. Systemic autoimmune diseases

1. Haemolytic autoimmune diseases

- Clinical disorder due to destructions of blood components. Auto Ab are formed against one's own RBCs, Platelets or Leucocytes.
- E.g. Haemolytic anaemia, Leucopenia, Thrombocytopenia, etc.

2. Localised autoimmune diseases or Organ specific autoimmune diseases

- A particular organ is affected due to auto Abs.
- For example:
 - Thyroiditis (attacks the thyroid)
 - Multiple sclerosis (attacks myelin coating of nerve axons)
 - Myasthenia gravis (attacks nerve-muscle junction)
 - Juvenile diabetes or Type I DM (attacks insulin-producing cells)

3. Systemic autoimmune diseases or Non-organ specific autoimmune diseases

Immune complexes accumulate in many tissues and cause inflammation and damage. They affect many organs or the whole body

- For example:
 - Systemic Lupus Erythematosus (anti-nuclear Ab.): Harms kidneys, heart, brain, lungs, skin...
 - Rheumatoid Arthritis (anti-IgG antibodies): Joints, hearts, lungs, nervous system...
 - Rheumatic fever: cross-reaction between antibodies to streptococcus and auto-antibodies.

Autoimmune Haemolytic anemia

It is Antibody mediated autoimmune diseases which results in lyses of RBC due to the production of autoantibodies against the RBC-antigens.

- RBC half life= 21 days, Ha.anaemia<7days
- Caused by Drug therapy [Penicillin, Anti-hypertensive agent like methyldopa results in destruction of RBCs]

Thrombocytopenia

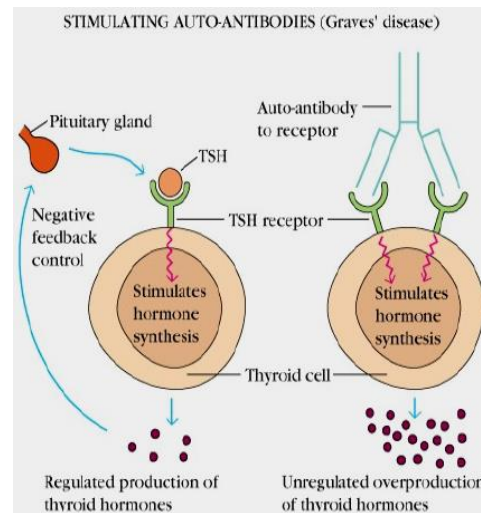
Antibody mediated autoimmune diseases Characterized by low platelet count due to the production of antiplatelet Ab. (IgG type)

Mechanism:

- An interaction of Ab with bound drug or new Ag. causes intravascular agglutination of platelets & subsequent destruction by phagocytic cells.

Thyrotoxicosis or Grave's disease

- The Ab (IgG type) is directed against the receptor for thyroid stimulatory hormone (TSH)
- This Ab is called as Long acting thyroid (LATS) stimulator or thyroid stimulating Ab (TSab).
- Primary causes: Stimulation of Thyroid gland to secrete more TH (Hyperthyroidism) resulting in Exophthalmus , bulging eyes & Goitre.



In Graves' disease, the antibodies do not destroy the thyroid but act as if they are TSH (i.e., they bind and activate the TSH receptor)

Hashimoto's thyroiditis

It is a T-cell associated auto immune disease caused by auto Ab of IgG & IgM type against the constituents of thyroid gland (Thyroid epithelial cells, colloid & nuclear components) leading to atrophy of thyroid gland, which results in hypothyroidism & destruction of thyroid tissue, characterised by Goitre, enlarged thyroid gland, deficiency of TH (Thyroxine)

Addison's disease

It is caused by auto Ab against zona glomerulosa cells of adrenal cortex resulting in deficiency of glucocorticoid (cortisol) and mineralocorticoid (Aldosterone) which leads to inability to withstand stress, hypotension, hypoglycemia and fatigue

Lichen planus

It is a mucocutaneous T cell mediated autoimmune diseases, the oral lesion is of many different forms; reticular, atrophic, bullous, erosive and ulcerative. T cells produce cytokines that attack epithelial layer resulting in apoptosis (induced death of the cell)

Myasthenia Gravis

It is caused by auto antibody against muscle antigen that leads to muscular weakness and fatigue. Patient becomes tired when speaking, eating & walking, also Ab attacks acetylcholine receptor antigen, so it cannot be produced, thus nerve impulse cannot be transmitted from the nerves to the muscles. Hence the neuromuscular junction is severely affected.

Systemic Lupus Erythematosus (SLE)

It is a skin disease due to the production of antinuclear factor (ANF) or antinuclear auto Ab, ANF reacts with the breakdown products of nuclei in the normal wear & tear of cells & form immune complexes which cause the tissue damage.

Appearance of blood red spots over the bridge of nose & cheeks. The lesions take the shape of a butterfly.

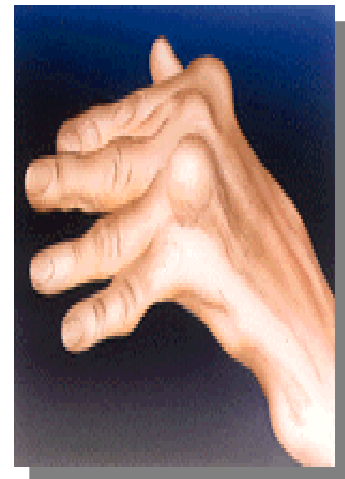
Connective tissues of the skin, kidney, heart. Spleen & blood vessels are severely damaged resulting in joint pain, fever & anaemia.

Glomerulonephritis due to deposition of immune complex in the glomerulus region.



Rheumatoid Arthritis

It is a chronic systemic disease of the joints caused by the auto Antibody of IgM type, called as rheumatoid factors. The disease is characterized by marked inflammatory changes in the synovial membrane & atrophy of bones. In later stage, deformity & ankylosis develops.



Treatment of autoimmune diseases

Haemolytic anaemia: treated with Vit B₁₂

Thyrotoxicosis: treated with antithyroid drugs.

Myasthenia Gravis: treated with Choline esterase inhibitors

Rheumatoid Arthritis: TMJ involvement: anti-inflammatory drugs, a mouth guard or splint worn at night is often helpful. When symptoms subside, mild jaw exercises help prevent excessive loss of motion. Surgery is necessary if ankylosis develops

Lupus Erythematosus: treated with immunosuppressive or antimetabolic drugs such as Corticosteroid, Cyclophosphamide and azathioprine.

Addison's disease: treated with systemic corticosteroids

Hashimoto's thyroiditis: treated with thyroxine

Lichen planus: treated with systemic and/ or topical steroid