

AUTOIMMUNITY & AUTOIMMUNE DISEASE

Dr. P. Raja, M.Sc., Ph.D.

Assistant Professor

Department of Zoology

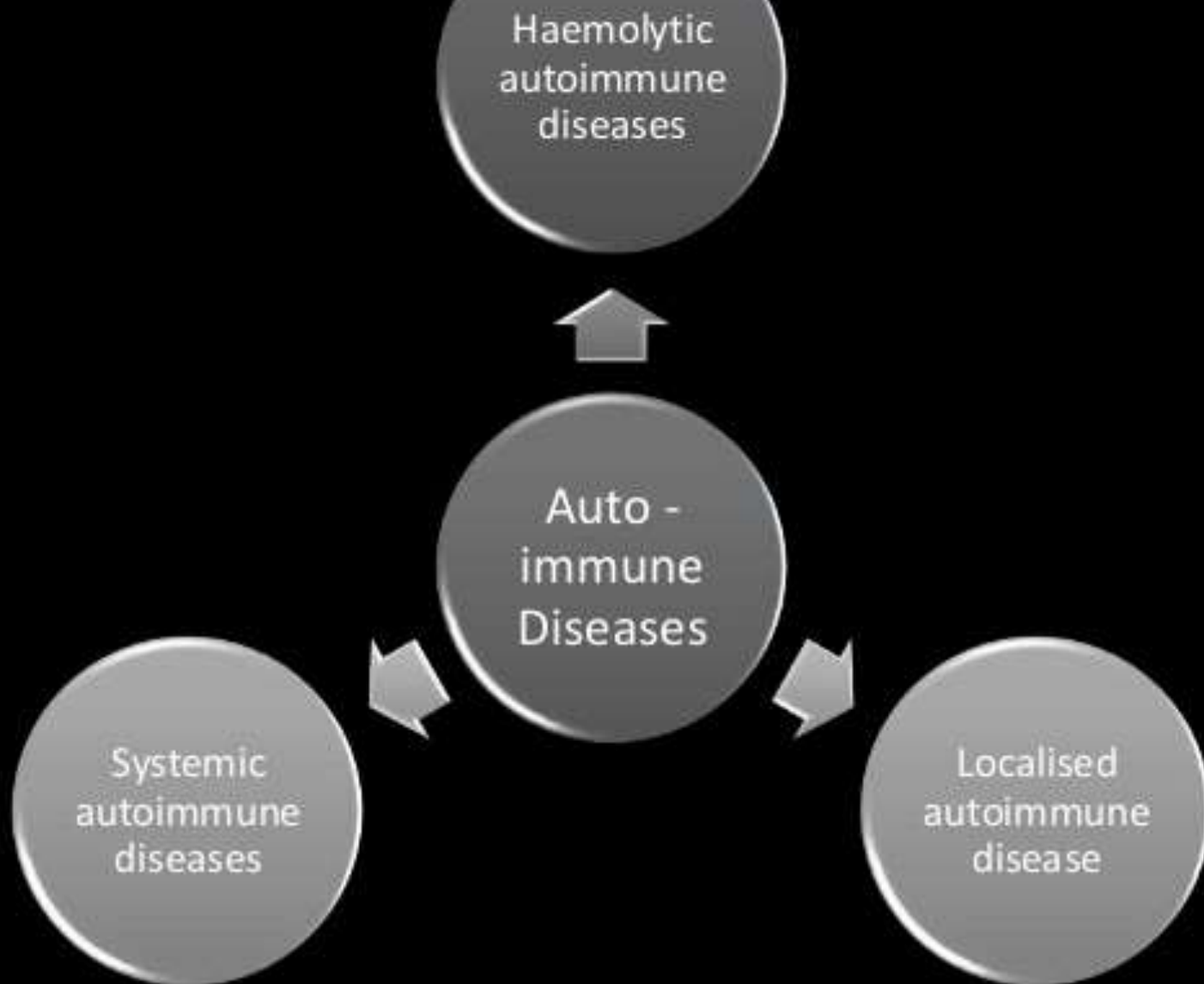
St. Xavier's College (Autonomous)

Palayamkottai

INTRODUCTION

- 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.
- An autoimmune disorder may result in:
 - The **destruction** of one or more types of body tissue
 - **Abnormal growth** of an organ
 - **Changes** in organ function

Based on organ involved



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.

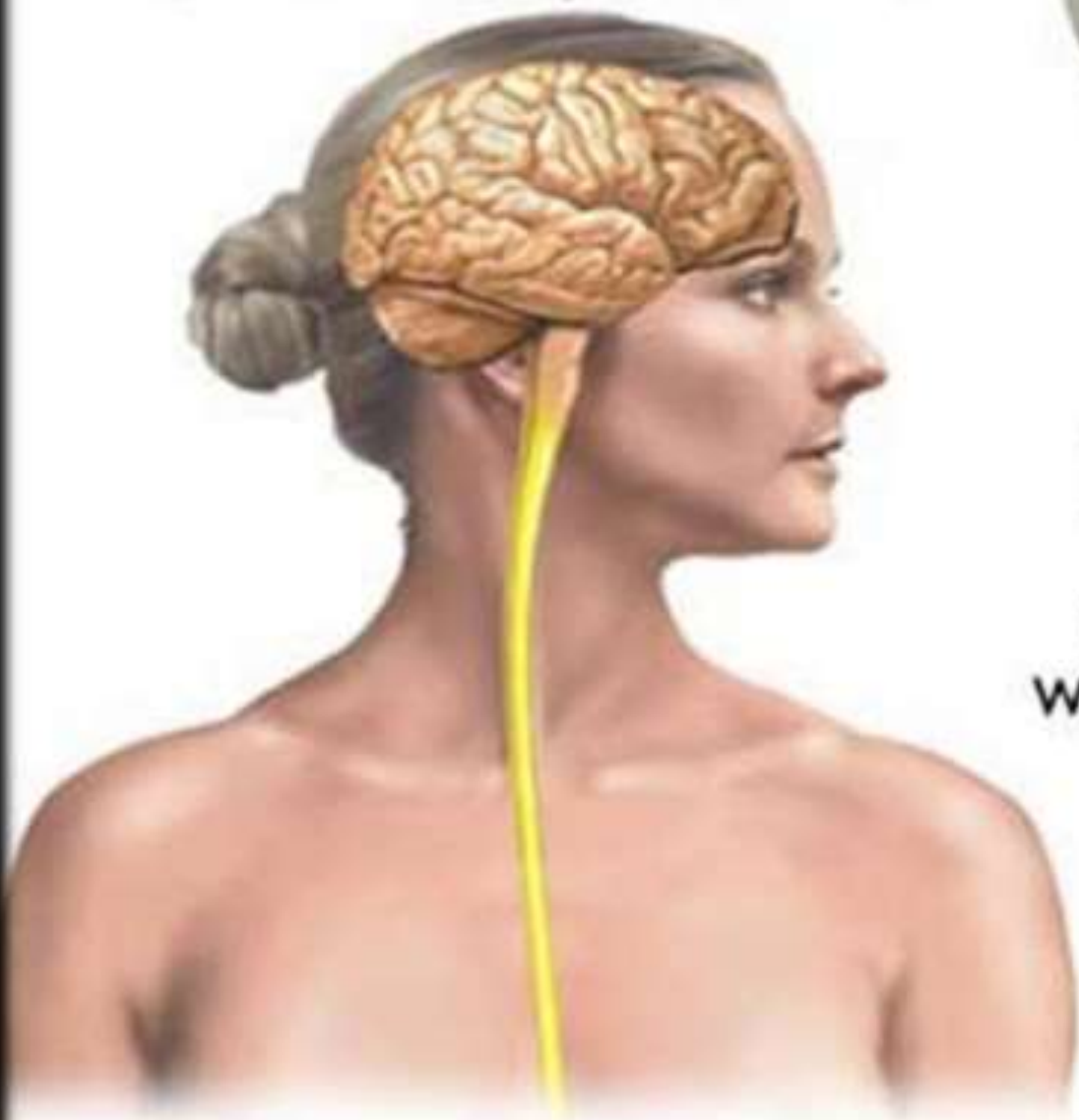
2. Localised Autoimmune Disease

- A particular organ is affected due to auto Abs,
 - For example ;
 - Thyroiditis (attacks the thyroid)
 - Multiple sclerosis (attack myelin coating of nerve axon)
 - Myasthenia gravis (attack nerve-muscle junction)
 - Juvenile diabetes or Type 1 DM (attack insulin producing cells)

Multiple Sclerosis

- Degeneration of nerves CNS (brain and spinal cord).
- Myelin disappear due inflammation.

Central nervous system
(brain and spinal cord)



In multiple sclerosis the myelin sheath, which is a single cell whose membrane wraps around the axon, is destroyed with inflammation and scarring

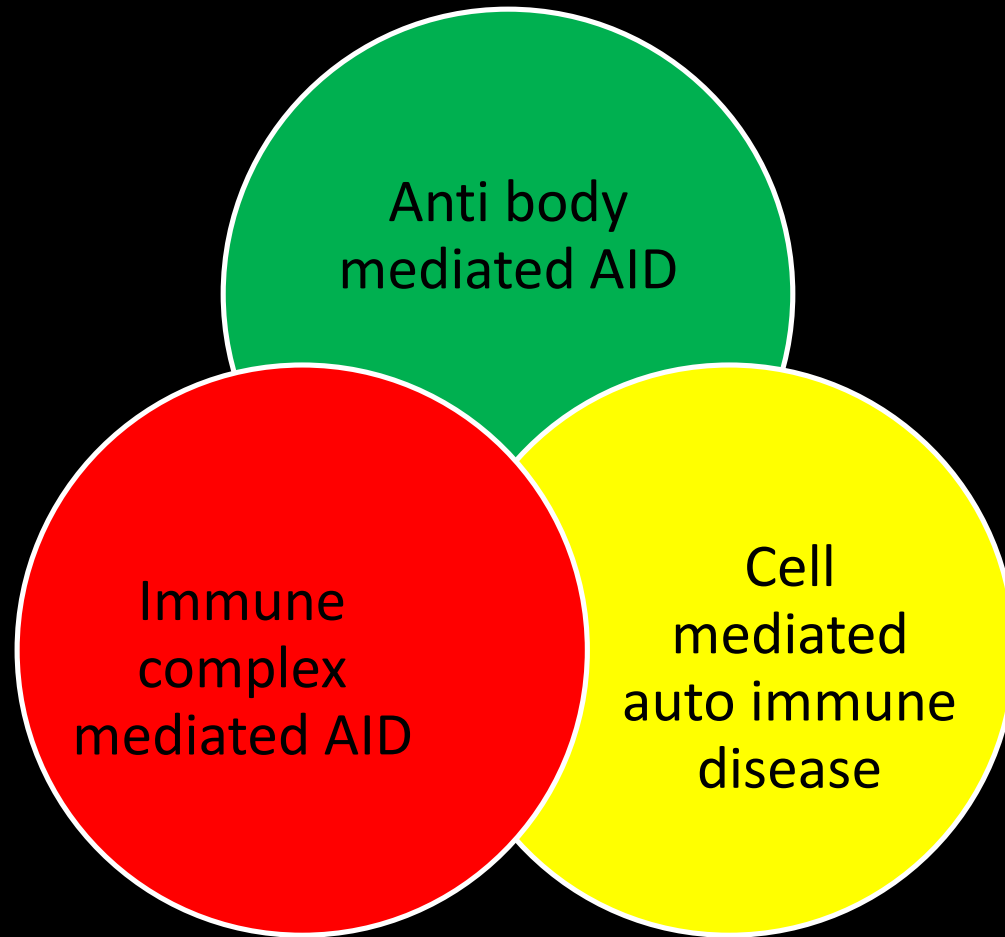
Type I diabetes

- β cells produce little or no insulin.
- Heritable
- Symptoms are like being very thirsty, hungry, tired or fatigued, urinating more often.

3. Systemic autoimmune disease

- Non organ-specific autoimmune diseases
- Immune complexes accumulate in many tissues and cause inflammation and damage.
- 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.

Based on type of Immune Response



Antibody mediated autoimmune disease

- Caused by autoimmune antibodies
- They are humoral autoimmune response

Eg. Pernicious anaemia

Thrombocytopenia

Thyrotoxicosis

Addison's disease

Myasthenia gravis

Pernicious anaemia

Causes :

Deficiency of vit-12 (cyanocobalamine)

Symptoms:

Anaemia ,Fatigue, low blood pressure, memory loss,jaundice , etc ,

Diagnosis :

- Large megaloblastic erythrocytes
- Anti parietal cell antibodies
- Atrophic gastritis

Treatment :

- Injection of B 12 once in a month
- Blood transfusion

Myasthenia Gravis

Causes :

auto antibodies formed against acetyl choline receptor

Symptoms:

severe muscle weakness , weakness of eye muscle , drooping hand , double vision

Diagnosis :

Examination of acetyl choline antibodies

CT or MRI scan of chest

Electromyography – checking muscle

Treatment :

Rest

Immunosuppressive drugs

Thyrotoxicosis

Causes :

Autoantibody against the receptor of thyroid stimulating hormone

It causes to over secretion of thyroxine and hyperthyroidism

Symptoms:

Exophthalmic goitre

Hyperthyroidism

Treatment :

can be treated with antithyroid gland

Immune complex Mediated autoimmune disease

- These diseases are caused by auto immune complexes (autoantibody + autoantigen)
- It is due to humoral autoimmune response

Eg :

Lupus erythematosus

Rheumatoid arthritis

Rheumatoid Arthritis

Causes :

caused by autoantibodies of Ig M

Symptoms:

pain in the joint

swelling & inflammation of the joint

Fusion of joint - ankylosis

Diagnosis :

X- ray imaging

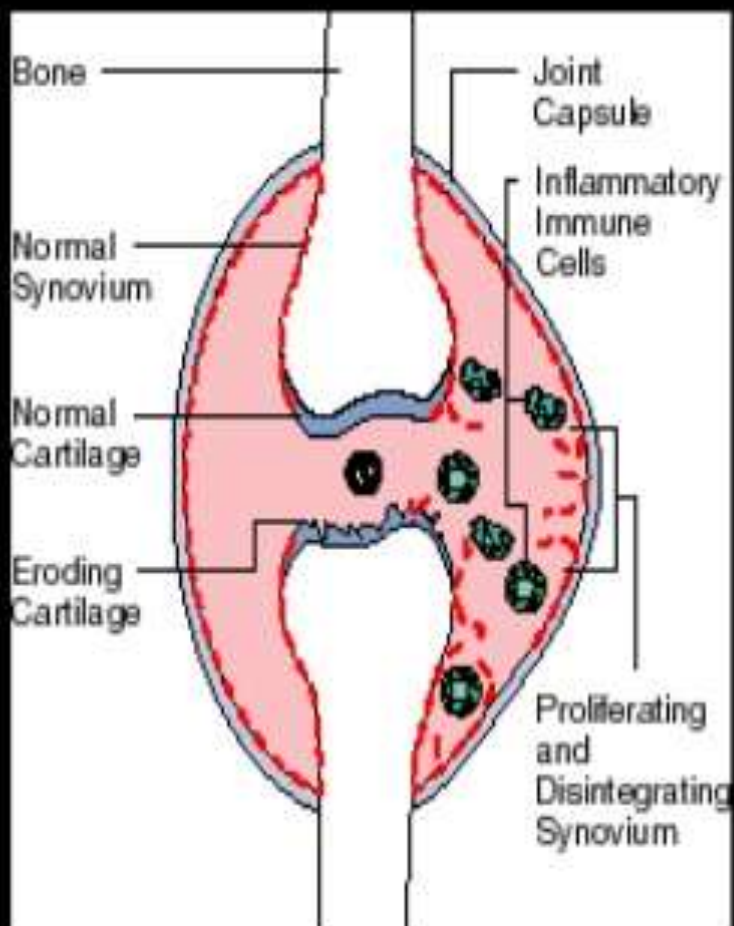
Examination of rheumatoid factor

Treatment :

Massaging the pain

Drugs

Joint replacement in severe cases



Condition of Rheumatoid Arthritis

Lupus Erythematosus

Causes :

antinuclear autoantibodies against tissue antigens

Symptoms:

Fever, joint pain , weakness, kidney dysfunction, vasculitis.

Diagnosis :

Examination of antinuclear autoantibodies
observation of lupus erythematosus cell

Treatment :

treated with immunosuppressive or antimetabolic drug such as corticosteroid, cyclophosphamide, azathioprine.

Cell mediated Autoimmune disease

- These are caused by activated T cells

Eg:

Hashimoto's thyroiditis

Hashimoto's thyroiditis

Causes :

auto antibody produced against thyroglobulin and thyroid peroxidase

Symptoms:

enlargement of thyroid gland ,weight gain, dry skin , ↑ cholesterol level

Diagnosis :

Ultrasound imaging of thyroid gland

Treatment :

Thyroid hormone intake. One tablet per day

THANK YOU