Lecture 12 : Lymphocytic disorders:

Lymphocytic Disorders are conditions that primarily involve the lymphocytes, a type of white blood cell critical for adaptive immunity. These disorders can arise due to abnormal production, function, or proliferation of lymphocytes. Below is an overview

Types of Lymphocytic Disorders

Lymphocytic disorders can be broadly classified into two categories: reactive (benign) and neoplastic (malignant)

1. Reactive Lymphocytic Disorders.

These conditions result from normal immune responses to infections or inflammatory stimuli

A. Lymphocytosis (Increased Lymphocyte Count)

1. Infections:

• Viral: Infectious mononucleosis (EBV), cytomegalovirus (CMV), HIV, rubella, mumps, hepatitis.

• Bacterial: Pertussis (whooping cough), tuberculosis.

• Parasitic: Toxoplasmosis.

2. Autoimmune Diseases : Rheumatoid arthritis, systemic lupus erythematosus (SLE).

3. Endocrine Disorders:Hyperthyroidism (e.g., Graves' disease).

B. Lymphocytopenia (Decreased Lymphocyte Count):

1. Primary Immunodeficiencies : Severe combined immunodeficiency (SCID) • . DiGeorge syndrome.

2. Secondary Immunodeficiencies:

• HIV/AIDS.

• Iatrogenic causes (chemotherapy, immunosuppressive therapy.(

• Malnutrition or stress.

Pathophysiology of AIDS

Etiologic agent of AIDS has been identified as the retrovirus HIV-1, this virus selectively infects helper T lymphocytes by binding to the lymphocyte receptors causing rapid, selective depletion of this lymphocyte subset

Patients infected with HIV progress through 3 recognized stages:

1. An asymptomatic carrier stage
2. An AIDS related complex stage (mild symptomatic stage)
3. Symptomatic AIDS with one of the disease defining clinical conditions.

Laboratory findings of AIDS

Multiple hematologic abnormalities are found in AIDS including leukopenia, lymphocytopenia, anemia. Positive serologic HIV antibody test, positive HIV nucleic acid test. macrocytosis occurs in up to 70% of patients.

2.Neoplastic Lymphocytic Disorders

These are malignancies of lymphocytes and lymphoid tissues, classified based on the type of lymphocyte affected and clinical behavior.

A. Leukemias

1. Acute Lymphoblastic Leukemia (ALL):Proliferation of immature lymphoid precursors (lymphoblasts). • Common in children.

• Subtypes: B-cell ALL and T-cell ALL.

2. Chronic Lymphocytic Leukemia (CLL):Proliferation of mature, abnormal B lymphocytes.Typically affects older adults.

B. Lymphomas

1.Hodgkin Lymphoma (HL): Characterized by the presence of Reed-Sternberg cells.

• Symptoms: Painless lymphadenopathy, B symptoms (fever, night sweats, weight loss

2. Non-Hodgkin Lymphoma (NHL): Includes a diverse group of lymphomas, such as diffuse large B-cell lymphoma (DLBCL) and follicular lymphoma.

• Symptoms: Generalized lymphadenopathy, extranodal involvement

C. Plasma Cell Disorders (B-cell Derived)

1. Multiple Myeloma :Malignant proliferation of plasma cells, producing monoclonal immunoglobulins.

2. Waldenström Macroglobulinemia :Lymphoplasmacytic lymphoma with IgM monoclonal gammopathy.

D. T-cell and NK-cell Neoplasms

Peripheral T-cell lymphoma and aggressive NK-cell leukemia are rare but highly malignant.

Symptoms of Lymphocytic Disorders

- Lymphadenopathy (swollen lymph nodes).
- Fatigue and weight loss . Fever and night sweats.
- Increased susceptibility to infections.
- Easy bruising or bleeding (in leukemias).

Diagnostic Approach to lymphocytic disorders

1. Complete Blood Count (CBC):
    a. Lymphocytosis: Increased lymphocytes (reactive or neoplastic).
    b. Lymphopenia: Reduced lymphocytes (e.g., in HIV or immunodeficiency.(
2. Peripheral Blood Smear:
    a. Atypical lymphocytes in viral infections.
    b. Blasts in acute leukemia.
3. Flow Cytometry:
    Immunophenotyping of lymphocytes (e.g., CD markers).
4. Bone Marrow Biopsy:
    Assessment of lymphoid malignancies or marrow involvement.
5. Imaging Studies:
    CT, MRI, or PET scans to evaluate lymphadenopathy or organ involvement.

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