



Section 6

DISORDERS OF WHITE BLOOD CELLS

LEARNING OBJECTIVES

When you complete this section, you will be able to:

1. Recognize descriptions of the following WBC disorders: leukocytosis, neutropenia, lymphocytosis, agranulocytosis, lymphoma, leukemia

Common disorders affecting the development or function of WBCs are covered briefly in the following pages.

DISORDERS AFFECTING PHAGOCYTOSIS

These disorders make the body vulnerable to recurrent infections such as bacteremia (bacterial infection of blood), meningitis, and pulmonary infections. Genetic deficiencies that adversely affect phagocytosis can lead to systemic lupus erythematosus (SLE, a chronic disorder of connective tissue), advanced liver disease, and immune diseases.

NEUTROPHIL DISORDERS

LEUKOCYTOSIS, GRANULOCYTOSIS, NEUTROPHILIA

All three terms indicate increased circulating neutrophils (but not an increase in eosinophils or basophils). This is a very commonly encountered disorder in clinical medicine.

Causes: Bacterial infection; inflammation or tissue death (as in a myocardial infarction); uremia, acidosis, and other pathologic changes in the content of blood; cancer; acute hemorrhage; removal of the spleen.

Leukopenia, Neutropenia, Granulocytopenia

-penia is a suffix denoting a depression in amount. Neutropenia results from either decreased neutrophil production or abnormal destruction of neutrophils. The term usually indicates a neutrophil count below $1.50 \times 10^3/\mu\text{L}$. Agranulocytosis is severe neutropenia. Neutropenia increases susceptibility to serious bacterial or fungal infection.

Causes: Decreased production of neutrophils may be due to a genetic disorder, aplastic anemia, or cancer. It is a potential adverse effect of several therapeutic agents (cancer therapy, phenothiazine, anticonvulsants, some antibiotics). Abnormal neutrophil destruction may be due to infection, therapeutic drugs, hemodialysis, or disorders of the spleen.

LYMPHOCYTE DISORDERS

Lymphocytosis

Increased numbers of lymphocytes in the blood may occur in infectious mononucleosis (mono), a self-limited viral infection common in young people, and acute infectious lymphocytosis, a benign self-limited viral disorder.

The Leukemias

Literally, a cancer of the white blood cells in which uncontrolled, increasing numbers of abnormal WBCs occur in blood forming and other tissues. Types of leukemia are identified by the dominant cell involved:

- Immature lymphocytes predominate in acute lymphocytic (or lymphoblastic) leukemias (ALL) and chronic lymphocytic leukemias (CLL)
- Myeloid cells predominate in acute myelocytic leukemia (AML)
- Granulocytes predominate in chronic myelocytic leukemia (CML)

Causes: Heredity, immune deficiencies, chronic marrow dysfunction, environmental factors (radiation, toxic chemicals), viruses.

Lymphomas

This group of neoplasms that arise in the reticuloendothelial system (RES) and lymphatic system include:

- Hodgkin's disease, a chronic disease involving the lymphatic system and a wide variety of changes in WBCs; eosinophilia may be present, and anemia may develop in advanced cases
- Malignant lymphomas and non-Hodgkin's lymphomas