CHAPTER

1

Introduction to Haematology

Learning Objectives

After completion of this practical, the students shall be able to:

- Define haematology
- Name routine haematological tests
- Enumerate functions and components of blood

■ INTRODUCTION

- Hematology is the science that deals with the study of blood.
- In a 70 kg normal adult person, blood volume is about 5–5.5 litres. There are several haematological investigations, that are routinely performed in laboratories. All haematology tests do require adequate skill; however, recently most of the investigations have been done by automated machines. Blood samples for all these haematological tests are obtained by taking a prick (capillary blood) or by puncturing the vein (venous blood). Arterial blood samples are required for some specific blood investigations.

■ COMPONENTS OF BLOOD

Blood has two types of major components—(1) cells, and (2) plasma.

Cellular Component

- Cellular component contain red blood cells, white blood cells, and platelets (thrombocytes).
- Red blood cells (RBCs) constitute the highest number, they are present in millions (4–5.5 million/mm^3 of blood). RBCs help in the transport of gases. White blood cells (WBCs) are in the range of thousands (4,000–11,000/mm^3 of blood). WBCs assist the defence function of the body.
- Platelets are in 1 to 3 lakhs/mm^3 of blood. Platelets help in the arrest of bleeding (hemostasis).

Plasma Component

- The fluid component of blood is plasma. Plasma contains fibrinogen and clotting factors.
- Plasma carries various substances like nutrients, hormones, waste products, etc.

■ SERUM

When fibrinogen is removed from plasma (during the process of coagulation), what remains is serum. Various investigations do require serum for tests (e.g. serum protein, serum glucose, serum triglycerides, etc.).

■ BLOOD SAMPLES

- Blood samples for various haematological tests can be obtained by capillary puncture (collection of blood from capillaries) and venepuncture (collection of blood from veins).
- For some investigations, one requires arterial blood, e.g. arterial blood gas (ABG) analysis.

■ ROUTINE HAEMATOLOGICAL TESTS INCLUDE

- Estimation of haemoglobin (Hb)
- Total RBC count
- Total WBC count
- Differential WBC count
- Erythrocyte sedimentation rate (ESR)
- Packed cell volume (PCV)
- Platelet count
- Blood group
- Bleeding time and clotting time
- Osmotic fragility of blood
- Specific gravity of blood.