

Hematology

Introduction

Hematology is the study of blood, and in a routine hospital, the laboratory is concerned largely with abnormalities of the blood. It is composed of two portions: formed elements (erythrocytes (red blood cells), leucocytes (white blood cells) and thrombocytes (platelets)) and plasma (a fluid medium). The formed elements compose about 45 per cent of the volume of the blood; plasma constitutes about 55 per cent. Plasma clots on standing; remaining fluid only if an anticoagulant is added. If whole blood is allowed to clot without anticoagulant and the clot is removed, the remaining fluid is called serum. It differs from plasma in the fact that it doesn't contain fibrinogen and some blood clotting factors (II, V, VIII). The majority of the cells suspended in the plasma are erythrocytes which comprise about 45 per cent of the total volume of the blood. The leucocytes are very much fewer in number but several different exist, each having different functions. The blood platelets are small protoplasmic discs which are concerned with the blood clotting process.

Capillary Blood

Capillary blood may be used for hemoglobin estimation, cell counts, blood grouping, bleeding and coagulation times. Although of great value in children, in adults with 'difficult' veins it is not only subject to sampling error but tests cannot be repeated in the laboratory, as the whole sample will have been used and further tests which may be required cannot be performed.

procedure

- 1- Select a suitable site for puncture
 - a- The lobe of the ear.
 - b- The ball of the finger, or the side of the thumb (in adults).
 - c- The base of the heel, or the great toe (in babies).
- 2- Clean the site with alcohol, and allowed to dry.
- 3- A quick stab is made with a presterilized disposable blood lancet.
- 4- Apply a little pressure to insure a free flow of blood. Squeezing must be avoided as this can cause lymph to dilute the blood, giving erroneous results.
- 5- Wipe away the first few drops of blood.
- 6- Gently, draw blood into the appropriate pipette or capillary tube.

7-If blood films are required, gently touch a fresh drop of blood onto one end of a clean, grease—free slide or onto a coverslip.

Venous Blood

Puncturing a vein with a needle attached to a syringe is called veinpuncture. If larger volumes of blood are required a venous sample of blood must be obtained.

Procedure

- 1 — Support the arm on the edge of a table.
- 2 — Inspect the veins, use a tourniquet if needed.
- 3 Clean the area with a swab of cotton dipped in alcohol and allowed to dry.
- 4 — Use a sterile, dry syringe of a size according to the amount of blood required, with a wide— bore and a short —Level needle.
- 5— Choose a proper vein and introduce the needle into the skin with a firm and smooth motion.
- 6 — Puncture the vein a few millimetres ahead of the skin puncture site and a little from the side of the vein.
- 7 — Draw the required amount of blood, and release the tourniquet.
- 8 — Withdraw the needle and put a fresh cotton swab over the skin puncture and ask the subject (or patient) to flex the arm at the elbow.
- 9-Remove the needle from the syringe and expel the blood gently into a prepared container of anticoagulant (if whole blood need).
- 10-Shake the container gently so that the anticoagulant mixes well with the blood and prevents coagulation.

In obese subjects or in very young children, blood may have to be collected from the veins on the back of the hand or femoral vein and the frontal venous sinus in the skull (in very young infants).

NOTE: All blood samples; (a) must be regarded as a potential source of infection (b) should be clearly Labeled with patient's name, number , time of collection and the date.