

Aim: Estimation of erythrocyte sedimentation rate (ESR)

REFERENCE: 1. Haematology, Practical Human Anatomy And Physiology, S.R. Kale et al., Nirali Prakashan, Eight Edition, 2002, pp. 28

Background: ESR is the rate at which erythrocytes sediment on their own weight when anticoagulated blood is held in a vertical column, it is expressed as the fall of RBCs in mm at the end of the first hour (starting point the tube or pipette was filled with blood).

Significance: The ESR is measured in terms of millimeters per hour. The sedimentation rate values vary from method to method used for their determination because it depends upon the length and diameter of the tube, which are variable from method to method. Normal Values according to Westergren's Method:

- Males- 0 to 5mm at the end of 1st hour.
- Females- 0 to 7 mm at the end of 1st hour

Three different methods estimate the ESR:

- 1) Westergren's Method
- 2) Wintrobe's Method
- 3) Cutler's Method

Westergren's method is one of the most suitable methods for laboratory purposes. This method is better than Wintrobe's since the reading obtained is magnified as the column is lengthier.

Significance: ESR is useful in diagnosing many diseases, though it is not specific for any particular disease. The increment in sedimentation rate is observed in conditions like rheumatic fever and arthritis, pneumonia, nephritis, cancer, syphilis, anemia, menstruation, tuberculosis, and leukemia.

APPARATUS REQUIRED: Spirit, cotton, syringe, Westergren's ESR pipette

METHOD: Westergren's Method

- 1) Westergren's pipette (open at both ends) is about 30 cm long with a bore diameter of about 2.5mm.
- 2) The lower 20cm are marked from 0 (top) to 200 (bottom).

3) The anticoagulant used is a 3.8% trisodium citrate solution. One part of the anticoagulant is added to four parts of the blood.

4) The pipette accepts about 1 ml of blood. Fill the pipette by sucking to the 0 mark and clamp it vertically in the Westergren rack.

5) Read the upper level of red cells exactly after 1 hour.

REPORT: The ESR of the given blood sample was found to be.....

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