

Erythrocyte Sedimentation Rate Measurement by VES Matic Easy, A Fast and Cheap method.



Pathology

KEYWORDS: erythrocyte sedimentation rate; semi automated laboratory instrument; VES Matic easy; Westergren method;

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ABSTRACT

Westergren method is the reference method to measure Erythrocyte Sedimentation Rate (ESR) by the International Council for Standardization in Haematology. However, a closed semi automated method, VES Matic easy (DIESSE, Italy), has been introduced as a new ESR measurement instrument. In this article, we compared the two methods (Westergren and VES Matic easy). The results obtained using VES Matic easy showed a good correlation with those obtained using the Westergren method. Supporting the hypothesis that VES Matic easy offers a fast and safe ESR determination, ensuring precision and a very good correlation with the reference method.

INTRODUCTION-

The erythrocyte sedimentation rate (ESR) is widely used as a screening test for patients with acute and chronic inflammatory diseases. Although it is non specific diagnostic test, it is used in monitoring and follow-up of certain groups of patients, such as those with rheumatoid arthritis, temporal arthritis, polymyalgia rheumatic, and Hodgkin's disease, where disease activity is mirrored by changes in the ESR. Recently, it was reported to be a prognostic value in the case of acute coronary syndrome and stroke and an independent predictor of mortality. The International Council Standardization in Haematology (ICSH) and the National Committee for Clinical Laboratory Standards selected the Westergren method, which makes use of undiluted blood sample with K2EDTA as anticoagulant (dilution less than 1%), as the reference technique for measuring ESR. The original ICSH reference method was based on the methodology of Westergren, which used diluted blood 4 volumes blood plus 1 volume citrate. Modifications of these specifications, particularly the use of undiluted blood, are now recommended as the basis of a new ICSH reference method. Because this method presents a lot of variables, such as specimen collection, time, and temperature of specimen storage, several new techniques for measuring ESR have been developed and introduced in clinical laboratories.

MATERIALS AND METHODS-

The study subjects were chosen randomly from the entire population of hospitalized and ambulatory patients to which ESR determination was routinely prescribed. All blood samples were collected in the K2EDTA tested within one hr of venipuncture. The population consisted of 964 patient samples obtained at RIMS, RANCHI and analyzed. The test group was composed of 412 males and 552 females, reference method was performed according to ICSH specifications on undiluted blood samples anticoagulated with K2EDTA using glass pipettes. Test tubes were gently and manually mixed for 20 times and pipettes were inserted into tubes until the column of blood rose to the start stopper. During sedimentation, the graduated pipettes were mounted vertically on appropriate supporting racks and kept at room temperature. After 1 hr, RBC sedimentation was recorded through visual determination.

VES Matic easy Method (Diesse, Italy) is a closed semi automatic system for determining ESR in K2EDTA tubes. Vesmatic easy tubes, prefilled with 0.25 ml of sodium citrate, are filled with blood up to the mark. There are two marks in the tube one lower and the other upper. Blood is taken above the lower mark but below the upper mark



The blood filled tube is inserted in the appropriate hole of the instrument, allow the samples to settle for a period of 20 min before the final reading at reader point. All the phases of the ESR are measured, by an innovative infra red optical system by using optic electronic elements.



The instrument holds the tubes at an angle of 18 degree. This angulation of tube enhances the esr rate. The Boycott phenomenon allows erythrocytes to sediment more rapidly down the wall of an angled tube than when falling vertically. Sedimentation of erythrocytes is measured more than 3 times faster and hence the result is obtained within 20 minutes. (Specially molded plastic Vacu-tec collection cuvettes containing 0.25 ml of a 0.105 mol/L sodium citrate solution and one ml of blood are available) The Results equivalent to the one hour or two hour Westergren method can be obtained in 20 or 40 minutes respectively. Ten samples can be evaluated simultaneously even when started at different times.

RESULT-

ESR was 24mm/hr (range: 2-92 mm/hr) for the reference method and 22mm/hr (range: 3-90mm/hr) for VES Matic EASY. There was a significant correlation between Westergren and VES Matic EASY measurements. The same results were also obtained considering the Spearman's rank correlation coefficient.

CONCLUSION-

Vesmatic easy is a semi automated, reliable, safe, cheap and faster method for ESR determination. Correlation of vesmatic easy with westergren's method of ESR determination is very good. Vesmatic easy completely avoids mouth pipetting. Vesmatic easy does not require any special training for its use. In one word it is one of the best methods for ESR measurement.

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