COMPARISON OF TWO SYSTEMS FOR THE DETERMINATION OF THE ERYTHROCYTE SEDIMENTATION RATE IN BLOOD/EDTA SAMPLES

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The Erythrocyte Sedimentation Rate (ESR) is a non-specific marker of the acute phase; it is performed diluting 4 parts of blood with 1 part of sodium citrate anticoagulant, recording the sedimentation of red cells in autologous plasma over a period of 1 hour in a dedicated glass pipette of definite dimensions. In recent years, automated systems designed to perform the ESR directly on non-diluted blood anticoagulated with EDTA have been developed. The first system of this kind available on the market has been the Test-1 (Alifax, Italy), about which evaluation reports showing contrasting results have been published and whose capability of performing a real ESR has been questioned. It has been recently developed the Ves-Matic Cube 30 system (DIESSE Diagnostica Senese, Italy) that determines the ESR directly in blood/EDTA samples in top lavender tube, by means of a new optoelectronic reading system. As in our laboratory it is use a Test-1 system, we have performed an evaluation of the Ves-Matic Cube 30 and of the Test-1, using as reference method the classic Westergren method. 174 samples, selected in order to cover all the range of possible values of the ESR (1 – 140 mm/h) have been analyzed by the three methods, considering the Westergren method as the “gold standard”. The results have been analyzed by means of the MedCalc software (MedCalc, Belgium):

**Passing – Bablok Regression (Fig. 1)**

Test-1: \( y = 4.53 + 1.53x \)

Ves-Matic Cube 30: \( y = -2.00 + 1.00x \)

the slope of the regression line deviates significantly from 1 in the case of Test-1
Bland – Altman analysis (Fig. 2)

Test-1 vs Westergren: limits of agreement -54,9 ÷ 25,6 mm/h, bias = -14,7 mm/h
Ves-Matic Cube 30 vs Westergren: limits of agreement -17,9 ÷ 23,2 mm/h, bias = 2,6 mm/h
The limits of agreement for the Test-1 are roughly the double of those for the Ves-Matic Cube 30.
The Spearman’s correlation coefficient was 0,85 (CI 95% 0,80 ÷ 0,88, p<0,0001) for the Test-1 and 0,91 (CI 95% 0,85 ÷ 0,94, p <0,0001) for the Ves-Matic Cube 30.
In conclusion, the Ves-Matic Cube 30 system shows a better correlation with the reference method than the Test-1, whose results sometimes deviate too much from the real ESR value.