

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

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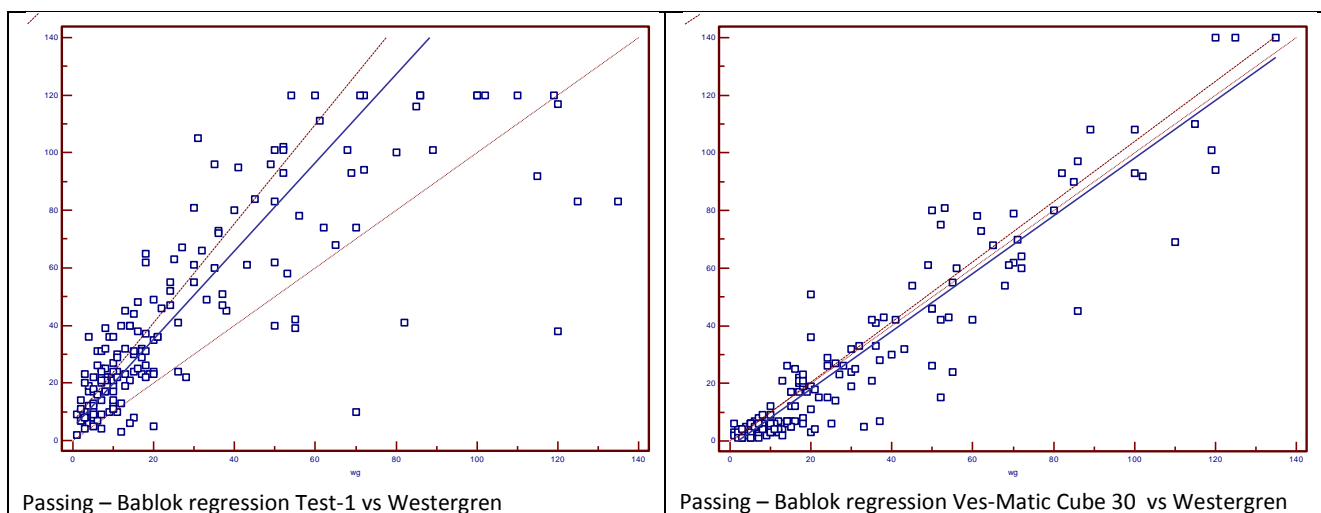
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The Erythrocyte Sedimentation Rate (ESR) is a non-specific marker of the acute phase; it is performed diluting 4 parts of blood with 1 part of sodium citrate anticoagulant, recording the sedimentation of red cells in autologous plasma over a period 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 (DIESE 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 used 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)

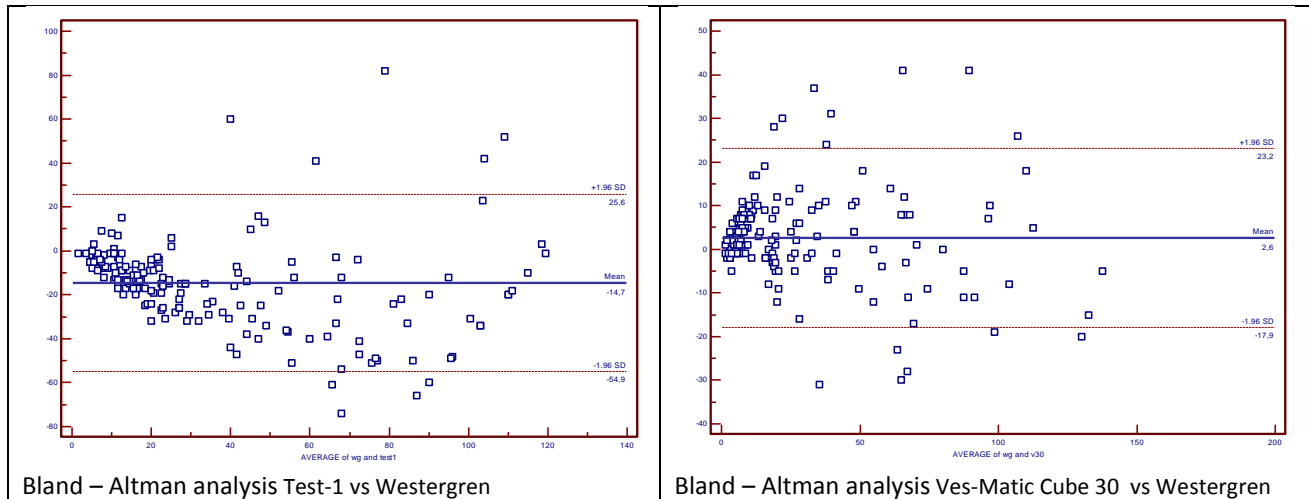
Test-1: $y = 4,53 + 1,53 x$

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 $-54,9 \div 25,6$ mm/h, bias = $-14,7$ mm/h

Ves-Matic Cube 30 vs Westergren: : limits of agreement $-17,9 \div 23,2$ 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% $0,80 \div 0,88$, $p < 0,0001$) for the Test-1 and 0,91 (CI 95% $0,85 \div 0,94$, $p < 0,0001$) 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.