



# MEASUREMENT OF ERYTHROCYTE SEDIMENTATION RATE (ESR) IN EDTA AND CITRATE BLOOD – COMPARISON OF VESMATIC 30, VESMATIC CUBE 30 AND VESMATIC CUBE 80 ANALYZERS

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**Background.** The erythrocyte sedimentation rate (ESR) is the most widely used laboratory test for monitoring the course of infections, inflammatory diseases and some types of cancer. Commonly, the ESR is performed in diluted citrate blood. Recently EDTA blood samples are used for this test because of avoiding the need for an extra blood sample for hematology analysis.

**Methods.** The VesMatic 30 analyzer measures ESR from diluted Sodium Citrate anticoagulated blood sample. Measuring unit measures by means of a digital sensor (opto-electronic unit). The VesMatic Cube 30 and the VesMatic Cube 80 measures ESR from  $K_2$  or  $K_3$  EDTA anticoagulated whole blood by means of a high power, white light LED as a light source.

**Results.** Comparison study of VesMatic 30 with VesMatic Cube 30 (n=196) showed Spearman's correlation coefficient  $\rho = 0,92$  (figure 1.); Passing-Bablok linear regression: slope 0,875 (95% CI: 0,809 to 0,941) and intercept -3,125 (95% CI: -4,470 to -2,071) (figure 2.); Bland-Altman analysis: bias (6,1) and limits of agreement (-13,5 to 25,7) (figure 3.).

Results of comparison of VesMatic 30 with VesMatic Cube 80 (n=120) were: Spearman's correlation coefficient  $\rho = 0,95$  (figure 4.); Passing-Bablok linear regression: slope 1,200 (95% CI: 1,130 to 1,272) and intercept -2,200 (95% CI: -3,409 to -1,174) (figure 5.); Bland-Altman analysis: bias (-1,8) and limits of agreement (-15,4 to 11,8) (figure 6.).

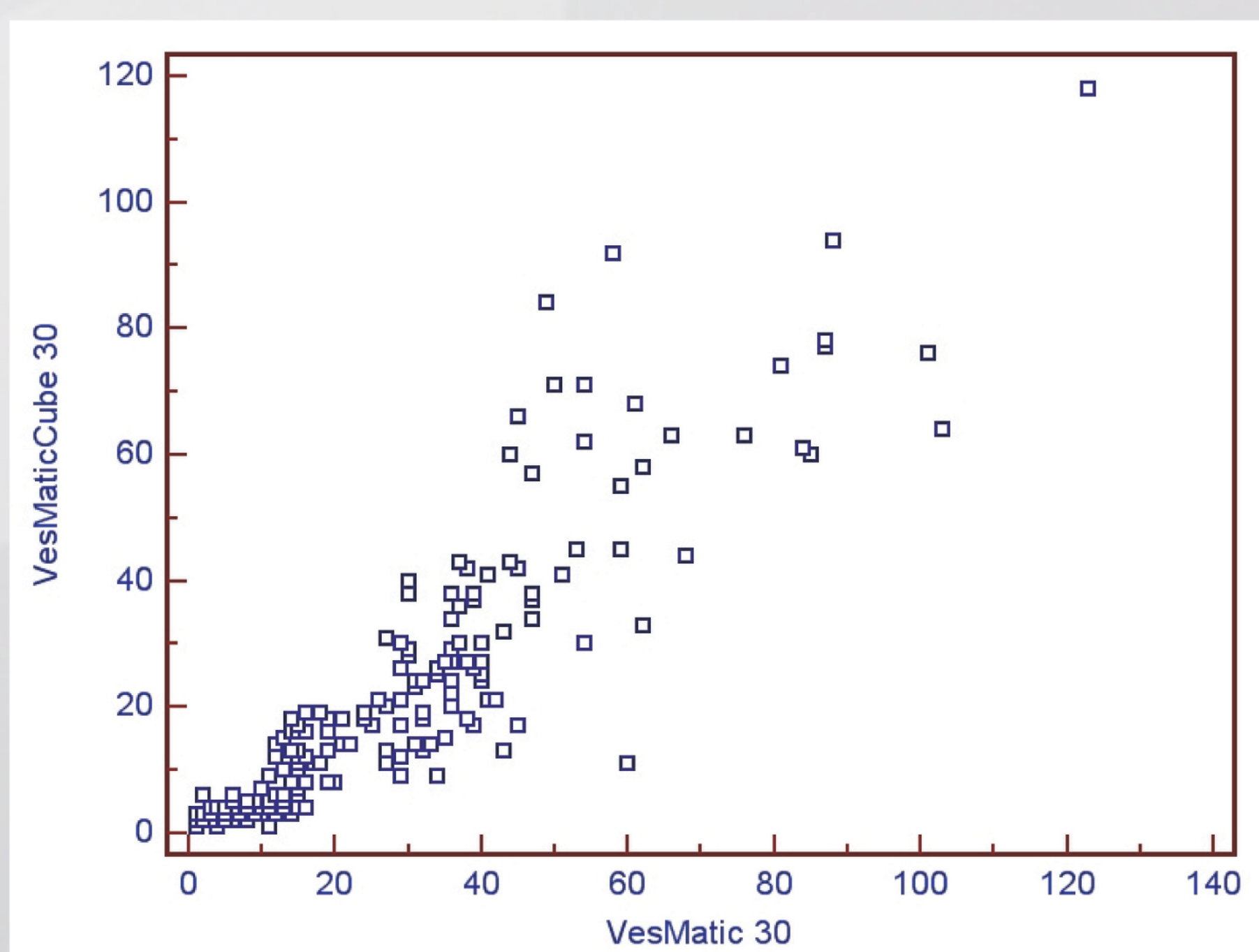


Figure 1. Spearman's correlation

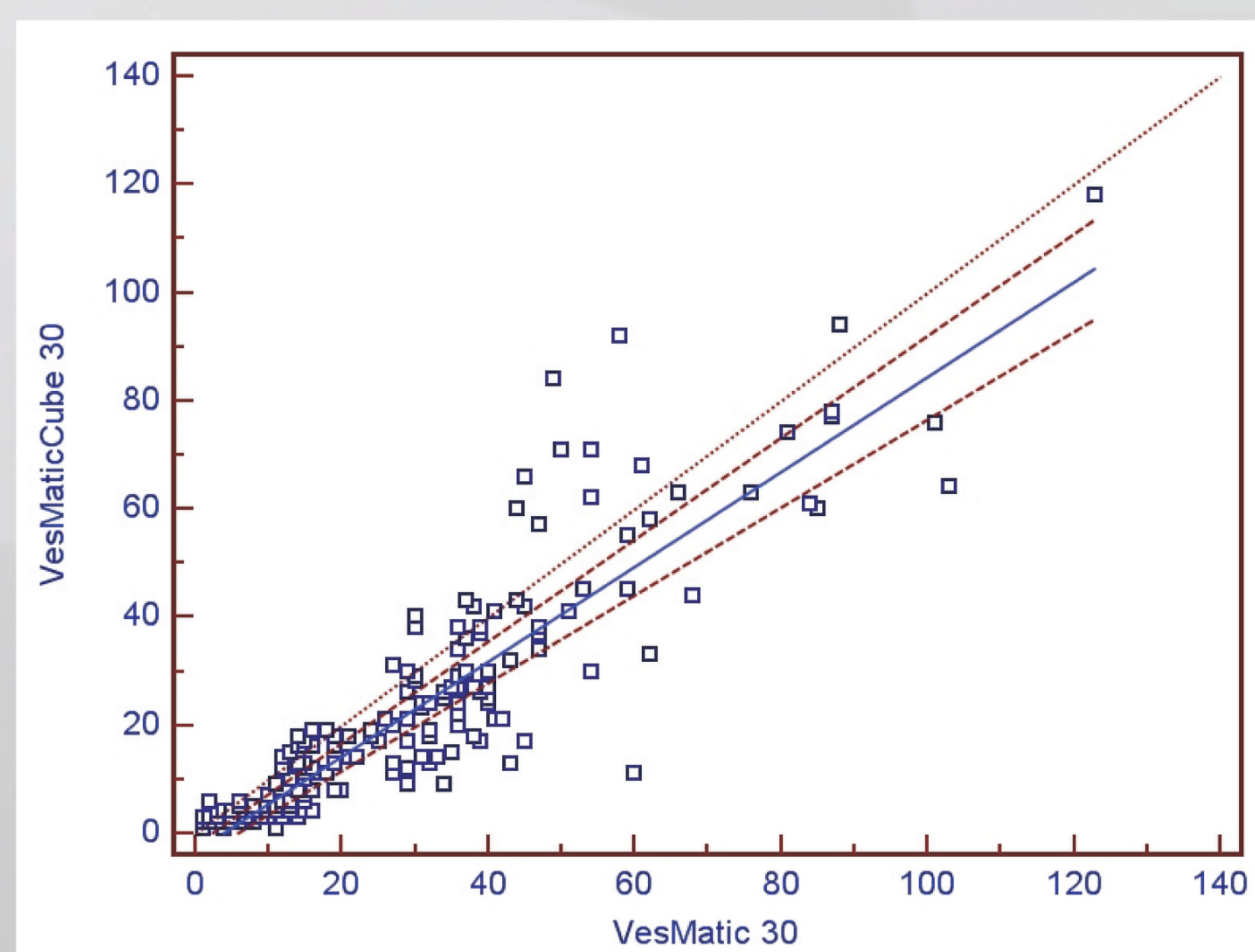


Figure 2. Passing-Bablok linear regression

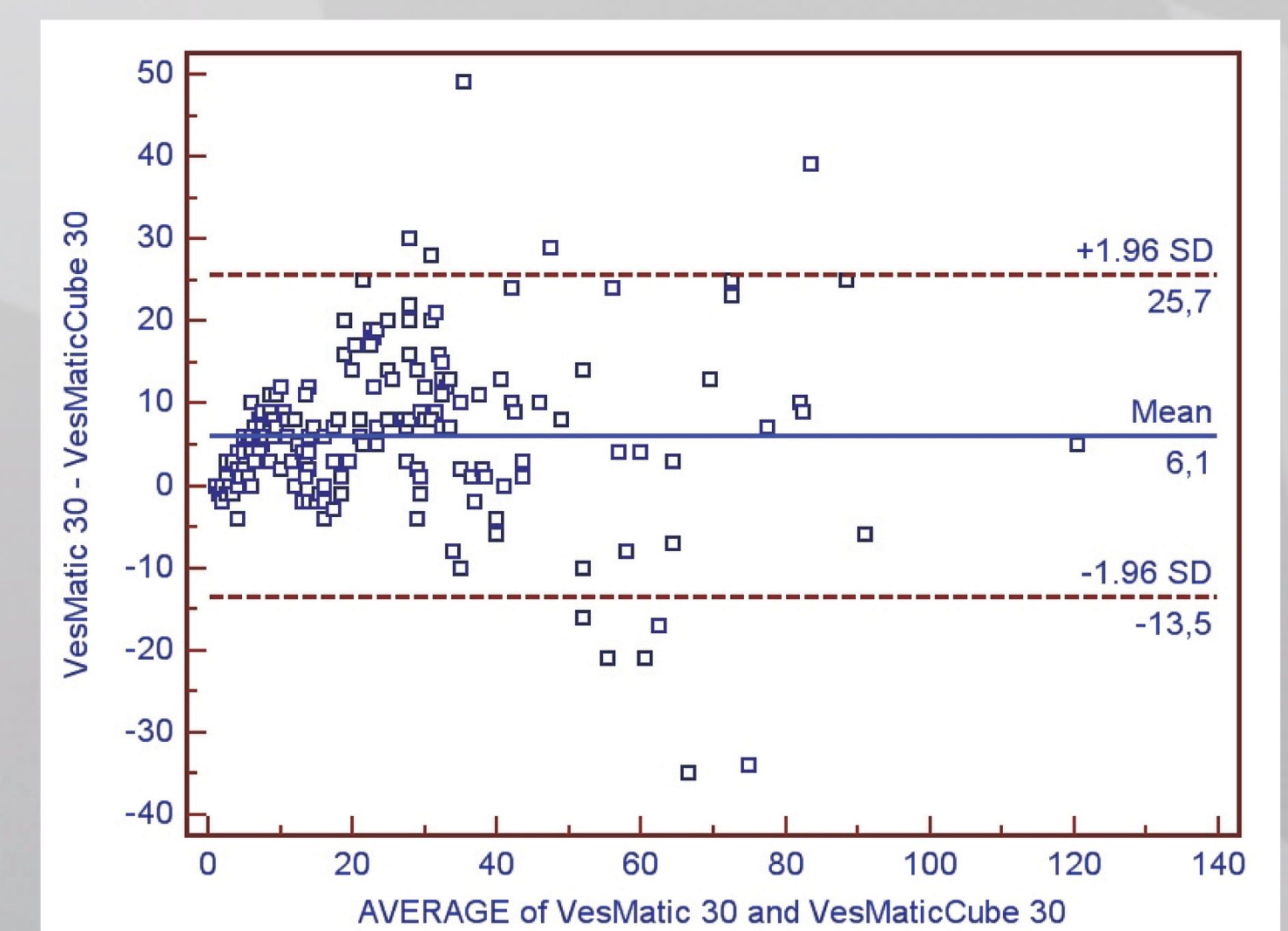


Figure 3. Bland-Altman analysis

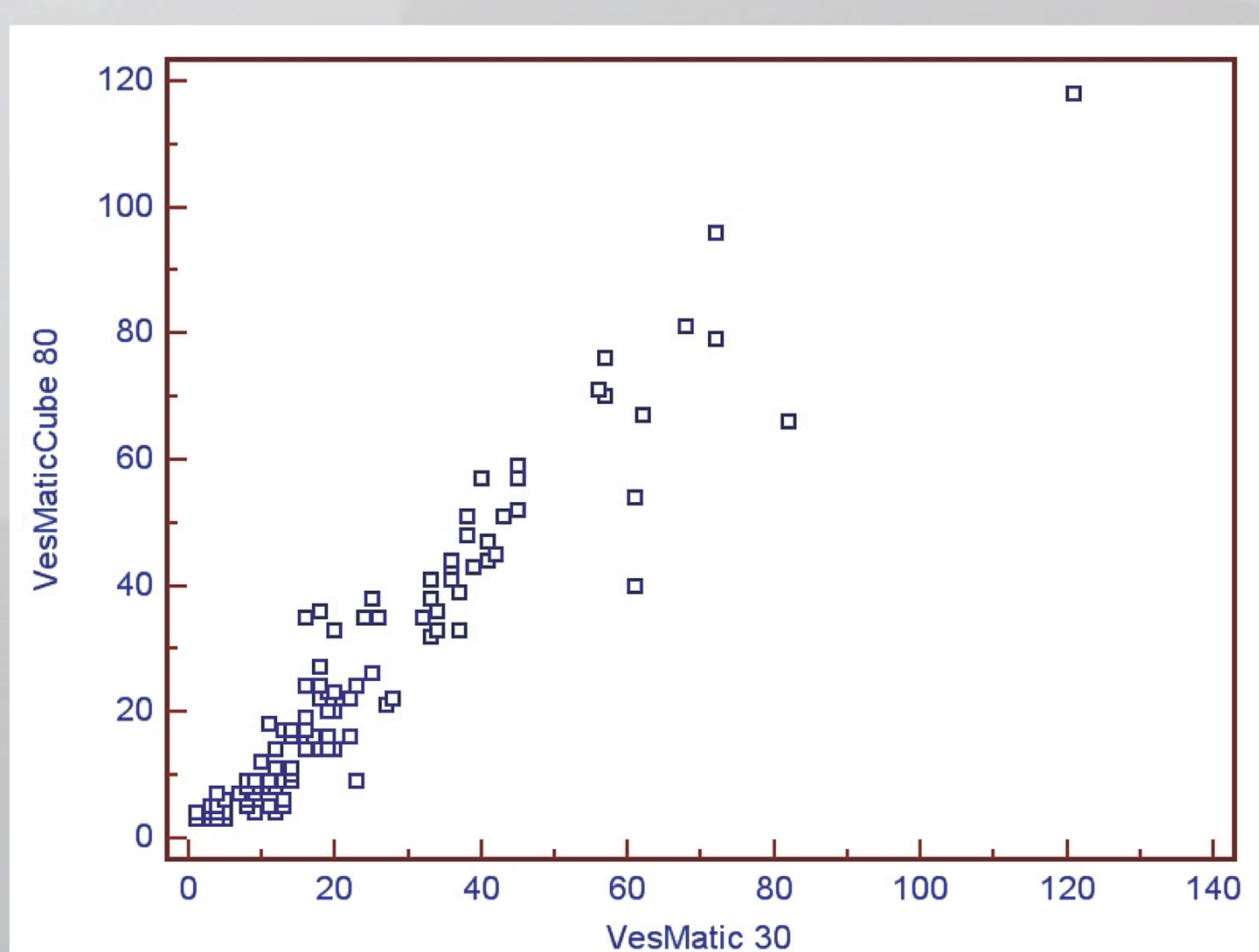


Figure 4. Spearman's correlation

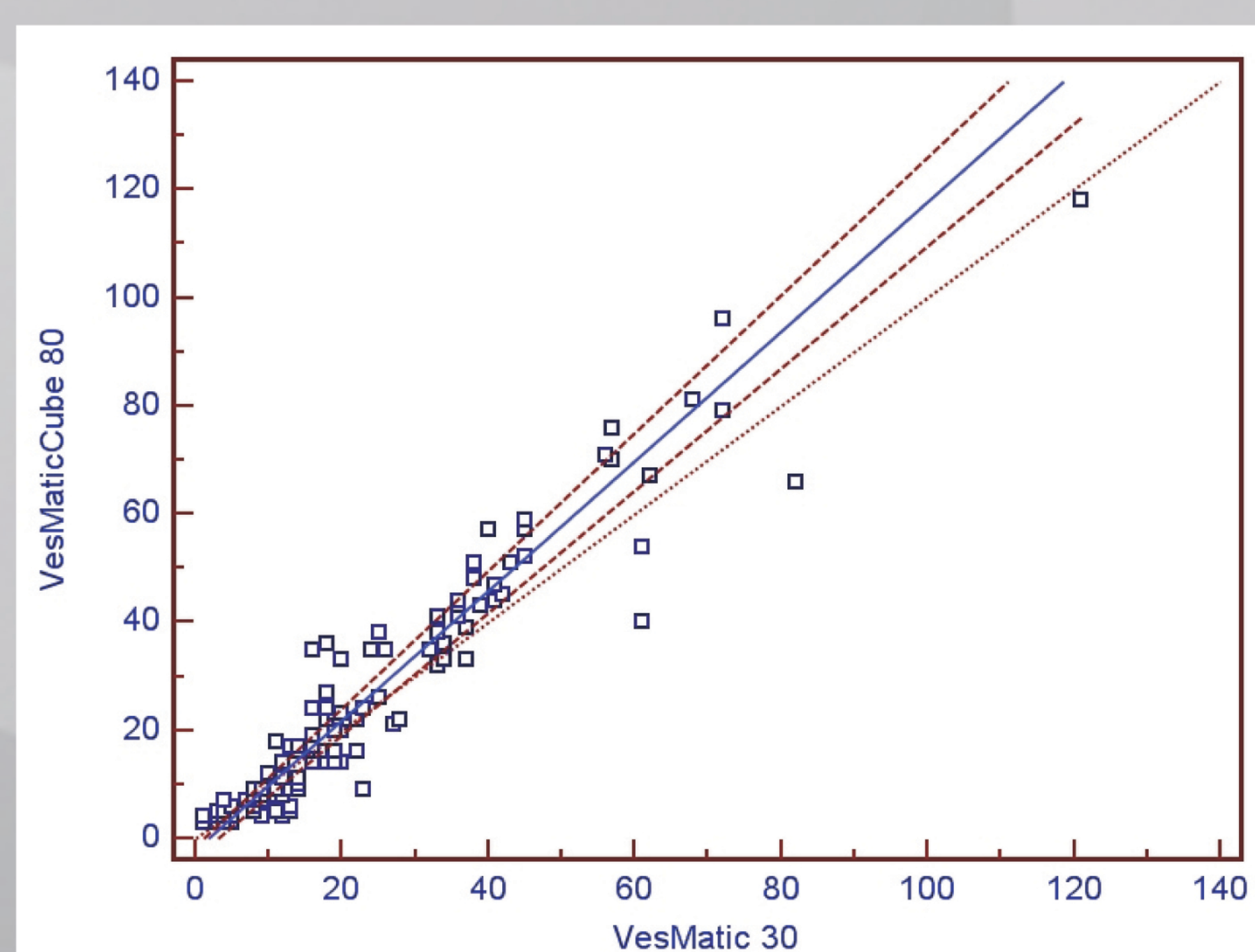


Figure 5. Passing-Bablok linear regression

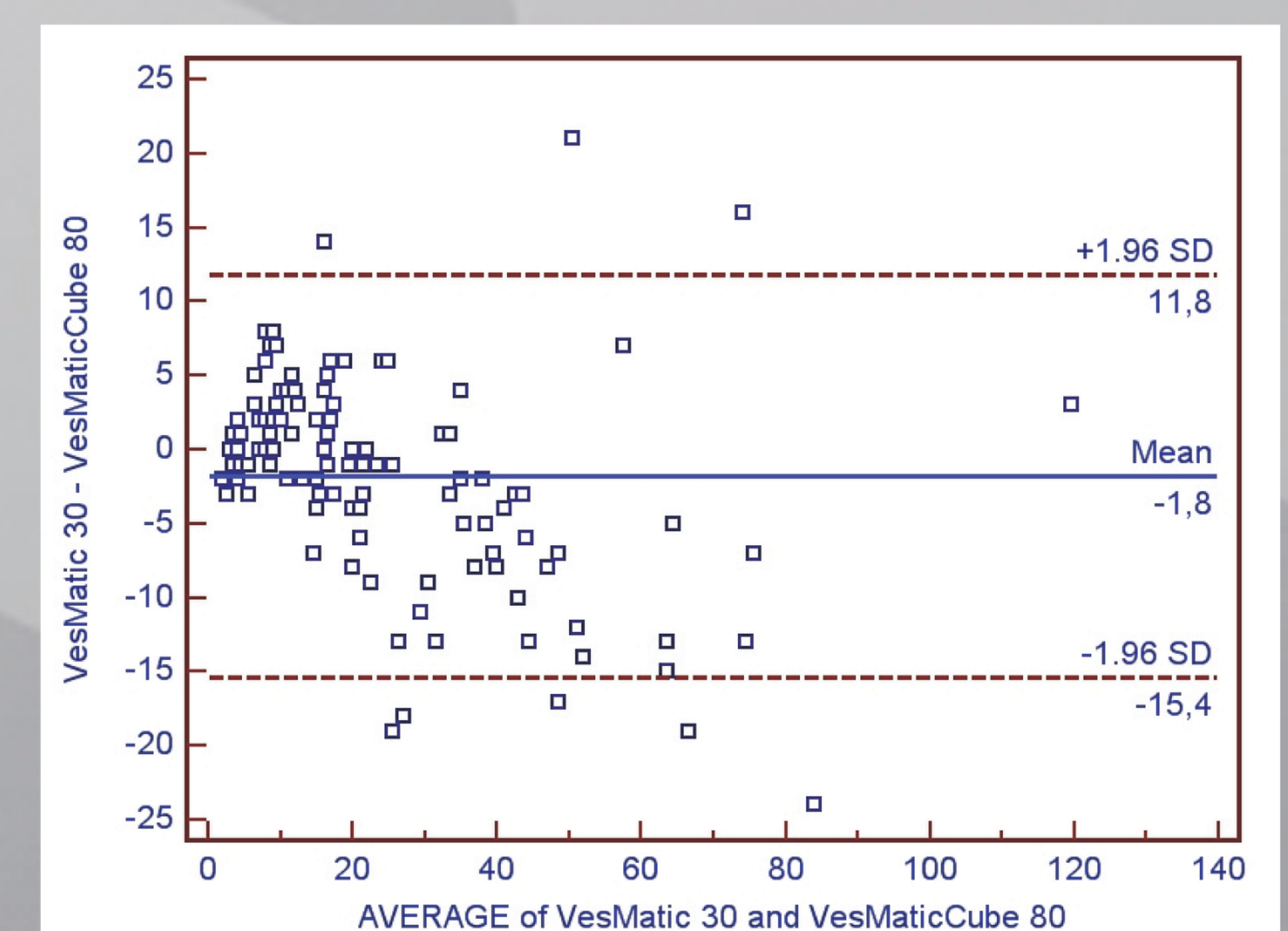


Figure 6. Bland-Altman analysis

**Conclusion.** The VesMatic 30 showed slightly better correlation with the VesMatic Cube 80 than with the VesMatic Cube 30 which showed greater bias and wider limits of agreement. Nevertheless, the VesMatic Cube 30 and the VesMatic Cube 80 are reliable systems for automatic measurements of ESR in EDTA blood samples when compared to VesMatic 30. Those systems use of the advantages of the avoidance of a dilution step and the use of one sample for multiple hematological analysis.