A comparison study between the Siemens Advia 120 and the manual method for the differential WBC count in goats

T.K. Tsouloufi, C. Brozos, M. Kritsepi-Konstantinou, E. Kiossis, I.L. Oikonomidis
School of Veterinary Medicine, Faculty of Health Sciences, Aristotle University of Thessaloniki, Thessaloniki, Greece

Background

• The differential WBC count provided by the Advia 120 (A-Diff) using the ovine setting has been previously evaluated and compared with the M-Diff in sheep. Although differences were observed between the A-Diff and the manual count (M-Diff), it was proposed that the Advia 120 can be used for routine screening of the differential WBC count in sheep.

• The Advia 120 is equipped with caprine-specific software; however, the analyser has not been previously validated for determining the differential WBC count in goats.

Objectives

• The aim of this study was to compare the A-Diff provided by the Advia 120 using the caprine setting with the M-Diff in goats.

Materials & Methods

• The blood samples were collected into 10mL K3EDTA evacuated tubes and the CBC was performed within 4h of blood collection.

• CBCs were performed using the species-specific software of the Advia 120 haematology analyser (Siemens Healthcare Diagnostics, USA).

• Two independent observers performed the M-Diffs using Giemsa-stained blood smears by counting a total of 200 WBCs.

• The exclusion criteria were: i) tubes that were inappropriately filled or contained clots; ii) erroneous Advia peroxidase cytograms; and iii) blood smears of poor diagnostic quality due to the presence of a substantial population of leukocytes that appeared lysed or trapped in platelet clumps or because of the uneven distribution of the leukocytes in the blood smear.

• The ASVCP guidelines for method comparison were followed and the statistical analysis was performed using the language R (R Foundation for Statistical Computing, Austria).

Results

• Our study initially included 48 blood samples. After applying our exclusion criteria, 8 samples were excluded from further analysis.

• The correlation between the A-Diff and M-Diff was very strong for eosinophils (r=0.870, P<0.001), and strong for lymphocytes (r=0.796, P<0.001) and neutrophils (r=0.730, P<0.001), while no significant correlation was observed for monocytes (r=0.026, P=0.872).

• The Passing-Bablok regression analyses revealed statistically significant constant errors for neutrophils [5.83%; 95% confidence interval (CI): 0.41%, 12.18%] and eosinophils [1.89%; 95% confidence interval (CI): 1.17%, 2.71%].

• Bland-Altman analyses showed a statistically significant negative bias for lymphocytes (-5.0%) and a statistically significant positive bias for eosinophils 2.2%).

• The very low basophil percentages precluded a meaningful method comparison.

Conclusions

• The Advia 120 overall demonstrated good performance for the differential WBC count in goats and it can be considered suitable for routine haematological screening.

• Nonetheless, it should be emphasized that any abnormal result should be confirmed with a blood smear evaluation.

References
