THE EVALUATION OF VARIOUS HEMATOCRIT VALUE SAMPLES ON YUMIZEN SPS & DXH SLIDEMAKER STAINER II (SMS II) AUTOMATED SYSTEMS.

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BACKGROUND

High end laboratories are in the need of automated slide maker and stainer due to high pressure on turn around time for each patient's sample. Nowadays various automated slide makers and stainer are available for the diagnostic laboratories commercially and they propose various technical arguments. The good peripheral smear slides are important to identify the blood cells those are crucial to identify pathologies.
The aim of the study is to evaluate the quality of the slides produced by Yumizen SPS (HORIBA Medical, HQ France) which does not automatically adjust its spreading parameters (even if several smearing profiles can be manually set), versus DxH Slidemaker Stainer II (SMS II) (Beckman coulter Inc, USA) which adapts its smearing parameters according to the hematocrit value (HCT).

METHODS

20 samples were processed of various hematocrit values (from 17% to 45%) on hematology analyzers Yumizen H2500 (HORIBA Medical, France) and DxH 900 (Beckman coulter Inc, USA) followed by the automated slide maker and stainers of both companies as a reflex action. The same protocol was set on both company's slide maker and stainers analyzer: 2 minutes Wright, 2 minutes Wright Giemsa, 6 min Wright Giemsa buffer, 1 min distilled water and 2 min distilled water and then drying of the sample. The slides used in the Yumizen SPS are the StarFrost (from KnittelGlass) and those used in the SMS II have been provided by Beckman Coulter. These slides were all reviewed by Dr Sukesh Nair under the microscope at the laboratory and cells picture were digitalized for the review.

RESULTS

The results were studied mainly macroscopically and microscopically.
The macroscopic view was a criterion to understand the good length of the smear. The Figure 1 demonstrates the lengths of blood smears performed by SMS II and by Yumizen SPS are identical independently the HCT concentration. The automatic smearing adjustment of SMS II has no effect on the blood smear length.

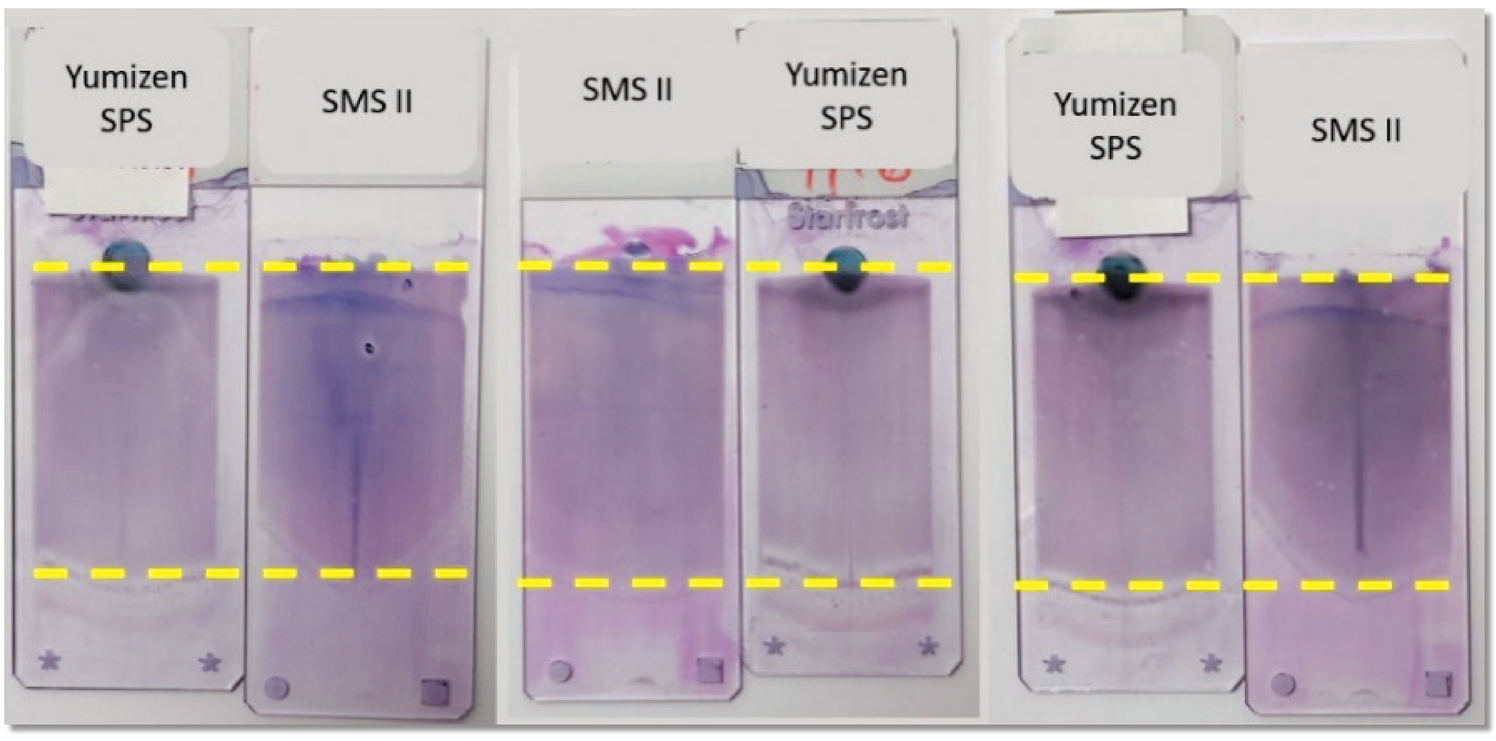

Figure 1: Examples of macroscopic blood smear view. Yellow lines highlight the start and the end of blood smears. Patient identification has been hided.

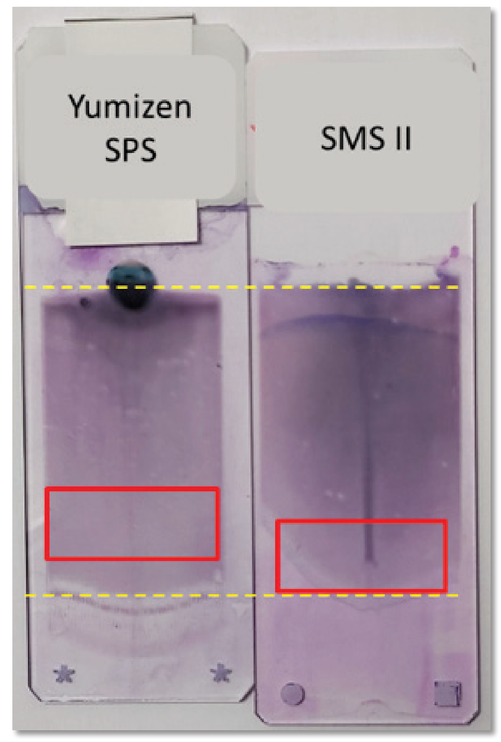

Figure 2: Examples of macroscopic blood smear view (Monolayer area). Left (HORIBA Medical Yumizen SPS), Right (Beckman Coulter SMS II)

The Figure 2 shows that the location of erythrocyte monolayer area of both smears is very closed (no reading impact), reason why the automatic smearing adjustment has almost no effect.

On a microscopic aspect, the digitalization of blood smears (refers to Figure 3) realized by Yumizen SPS and SMS II shows different quality of pictures. The pictures taken from HORIBA Medical slides show a better quality (higher resolution of granulations, less refractive RBC, cleaner background).

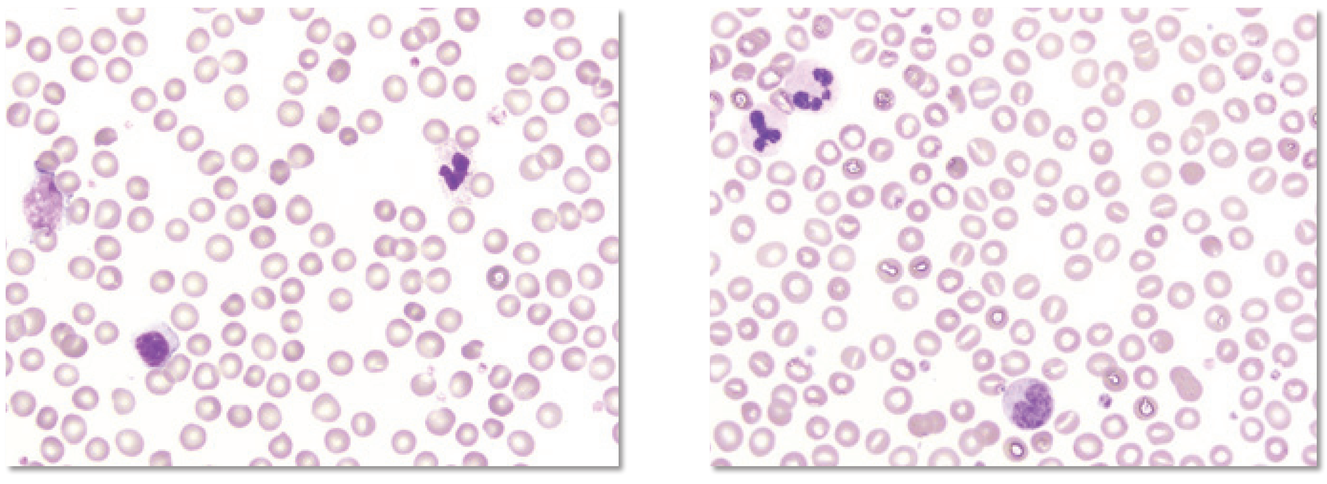

Figure 3: Microscopic views of the 2 blood smears taken from manual microscope with camera.
Left (HORIBA Medical Yumizen SPS), Right (Beckman Coulter SMS II)

CONCLUSION

The automatic smearing adaptation according to the hematocrit concentration has no real impact on the macroscopic aspect (same length and almost same location of the monolayer area) of the smear.
Regarding the microscopic aspect, a better quality of blood smears was observed on Yumizen SPS slides whom the origin maybe either the quality of stains and/or the quality of slides.