Reviewer's report

Title: Comparison of haematological parameters determined by the Sysmex KX-21N automated haematology analyzer and the manual counts

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Reviewer: Carol Briggs

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All comments major compulsory revisions.

This manuscript describes a very limited and incomplete evaluation and of a small automated blood analyser; manual methods were used for the comparison. The number of samples used in the evaluation is very small, only 60 with 30 samples with red cell abnormalities, no mention of white cell abnormalities is made.

The write up of the study is incomplete, the diagnosis of the patient samples with white cell abnormalities or instrument abnormal flags are not described at all.

The method section is insufficient, all manual methods should be described briefly, and one reference is insufficient. Presumably the MCHC was calculated using the manual haemoglobin and packed cell volume but the reader has to guess this is the case. How were the manual differentials performed? How many cells were counted, 100 or 400 by two individuals? Was the CLSI reference method used?

It is stated that four samples did not give a complete differential on four samples, <100 cells, this should read less than 100%, as the automated instrument counts thousands of white blood cells for the differential. Red cell abnormalities seen on the blood film are described but the automated blood count results are not reported, whether, for example, there was a low MCV or MCH corresponding to the microcytic hypochromic pictures seen, or any abnormal cell flags generated by the instrument. Were there any samples with abnormal white cells such as reactive lymphocytes? Manual methods are notoriously imprecise, manual white cell and platelet counts have very high coefficients of variation, figures of up to 25% have been published, this would certainly contribute to the statistical difference seen between the automated and manual results, this should be discussed.

The Sysmex KX instrument reports a three part differential, neutrophils, lymphocytes, and a mixed population of monocytes, eosinophils and basophils which are not reported individually. Table two gives results for the comparison of automated manual counts for eosinophils and monocytes while figure two shows a correlation graph for neutrophils, lymphocytes and eosinophils only. I am unclear how the automated results for the monocytes and eosinophils have been derived, this needs to be explained.

This manuscript needs to be re-written giving far more information in the methods.
and results section, as it is no conclusions supported by evidence presented can be drawn on the performance of the instrument compared to manual methods.

**Level of interest:** An article of insufficient interest to warrant publication in a scientific/medical journal

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I have received an unrestricted educational grant from Sysmex Europe in the last five years.