

PP 28. A comparative study between the sysmex and the BD FACSCanto II flow cytometer in determining leucocyte counts in leucodepleted blood products

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Background

Approximately 20 % of red cell concentrates issued by WPBTS are leucocyte reduced products. Leucocyte reduction is generally indicated to decrease the incidence of non-haemolytic transfusion reactions, HLA (Human Leucocyte Antigen) alloimmunisation, CMV (Cytomegalovirus) transmission and transfusion associated Graft versus Host Disease (GVHD).

The Standards of Practice for Blood Transfusion in South Africa (7th Edition) states that filtered blood products should have a leucocyte count $\leq 5 \times 10^7$ and buffy coat depleted $\leq 2.4 \times 10^9$ per transfused unit. WPBTS outsourced testing to an external SANAS accredited laboratory for flow cytometry using the BD FACSCanto II.

In 2015, WPBTS evaluated and validated the Sysmex XN for routine use. The analyser performs a Full Blood Count (FBC) including differential count using flow cytometry methods with a semiconductor laser. This replaced the Pentra XL80 in June 2015. The aim is to establish whether the Sysmex XN analyser is capable of LLLC (Low level leucocyte count) by comparing these results with the BD FACSCanto II results in order to reduce costs by not outsourcing these tests.

Method

Product samples ie. 137 buffy coat depleted and 232 filtered RBC (red blood cell) samples were tested in duplicate on the Sysmex XN and on the BD FACSCanto II. Results were analysed and compared. Reagent cost will be compared.

Results

The leucocyte counts were compared using the SANAS accredited external laboratory as the reference. 137 buffy coat depleted samples were analysed. 12 samples failed the specification of $\leq 2.4 \times 10^9$ per unit. 2 (1.5%) on both machines, 8 (5.8%) on the Sysmex XN and 2 (1.5%) on BD FACSCANTO II.

232 filtered RBC samples were analysed and results compared. When results were measured against the Standards of Practice for Blood Transfusion in South Africa ($\leq 5 \times 10^6$ per unit) all results on Sysmex XN and on BD FACSCANTO II met the criteria. When measured against the Council of Europe Standards ($\leq 1 \times 10^6$ per unit), all Sysmex XN results met the criteria while the BD FACSCANTO II achieved 97%, i.e. 8 failures.

Conclusion

The BD FACSCanto II using flow cytometry is generally accepted as being more sensitive when reading very low leucocyte counts. According to literature leucocytes deteriorate with age causing slight variation in results. Samples referred to the external laboratory were not always tested within 24 hours and this is reflected in the results presented.

After analysing the results, the QC of leucodepleted products performed on the Sysmex XN passed the criteria in The Standards of Practice for Blood Transfusion in S.A. A cost saving of +/- R122,386.26 per annum, would be realised by moving to in-house QC. WPBTS has made the decision to stop outsourcing QC for Low level leucocyte products.