A comparison of the granulocyte count from the ABX Micros ES60 and the neutrophil count from a 5-part differential analyser

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Aims

The aim of the study is to establish that the granulocyte count of a 3-part differential analyser correlates well when compared to the neutrophil count of a 5-part differential analyser, in the absence of specific flagging.

Objectives

The neutrophil count is an important parameter in determining the treatment outcomes, with regards to chemotherapy, for both oncology and haematology patients and also for some other drug therapies such as Clozapine. It is becoming increasingly popular to make these decisions using point of care testing (POCT) in order to achieve greater efficiency and improve patient pathways.

Methods

A study of 160 samples (100 with no flags related to granulocytes and 60 with specific flags), less than 4 hours old, were processed in duplicate by a 3-part differential analyser (ABX Micros ES60, HORIBA Medical). These samples were then processed in duplicate by a 5-part differential analyser (ABX Pentra DX120, HORIBA Medical) and the results were compared. The abnormal samples were placed into three categories showing flags related to granulocytes:

- Samples with G1 and/or G2 flags
- Samples with G1 and/or G2 flags plus M2
- Samples with G3 flag

The results were compared by correlation.

Samples with G1 and/or G2 Flags

The flagging indicates the presence of eosinophilia, myelocytes or band form neutrophils. The correlation was good (R = 0.984, n = 20) between the absolute neutrophil count on the 5-part differential analyser and the granulocyte count 3-part differential analyser.

Samples with G1 and/or G2 Flags plus M2

The flagging indicates the presence of eosinophilia, myelocytes or basophilia. The correlation between the absolute neutrophil count on the 5-part differential analyser and the granulocyte count 3-part differential analyser was not as good as without the M2 flag (R = 0.931, n = 20) with several outliers.

Samples with G3 Flag

The flagging indicates the presence of metamyelocytes, many types of large immature cells. The correlation was good (R = 0.9885) between the absolute neutrophil count on the 5-part differential analyser and the granulocyte count 3-part differential analyser.

Results

Samples with no granulocyte related Flags

Samples without the flags related to granulocytes showed excellent correlation between the neutrophil count on the 5-part differential analyser and the granulocyte count of the 3-part differential analyser (R = 0.995, n = 100). The WBC also gave excellent correlation between the two systems (R = 0.997).

Samples with G1 and/or G2 Flags

The flagging indicates the presence of eosinophilia, myelocytes or basophilia. The correlation between the absolute neutrophil count on the 5-part differential analyser and the granulocyte count 3-part differential analyser was not as good as without the M2 flag (R = 0.931, n = 20) with several outliers. The WBC, however, gave excellent correlation between the two systems (R = 0.998).

Conclusions

These results show an excellent correlation (R = 0.9885) between the granulocyte count from the ABX Micros ES60 and the neutrophil count from the 5-part differential analyser.

This suggests that the ABX Micros ES60 granulocyte count could be confidently taken as the neutrophil count in therapeutic drug monitoring, provided that no M2 alarms are triggered. Care should be taken with G1 flags, however, as these may be due to the presence of the relatively rare occurrence of eosinophilia. An addition flag, L1, (which suspect the presence of platelet aggregates or NRBC and are not granulocyte related) were seen in the 100 normal samples and showed no effect on the correlation of the WBC.