Cytoplasmic fragments of leukaemic cells masquerading as platelets in an automated haematology analyser

The accuracy of platelet counts has been a major achievement of automation in haematology laboratories. However, a large array of interfering substances can erroneously increase automated platelet counts. Thrombocytopenia, which may be overlooked in the presence of a spurious increase in the platelet count. Therefore, automated parameters require careful interpretation with respect to the clinical profile of the patient, along with blood smear examination.

A 10 year old boy presented with fever and leucopenia of two week’s duration. He was pale, and had cervical and axillary lymphadenopathy, with moderate hepatosplenomegaly. The automated complete blood count carried out on an Advia-60 machine (Bayer, Baroda, India), a three part differential analyser, revealed a haemoglobin of 99 g/litre, a total leucocyte count of $273 \times 10^9$ cells/litre, and a platelet count of $156 \times 10^9$ cells/litre. The differential count showed 92% blasts with an increase in the platelet count. The automated complete blood count carried out on an Advia-60 machine (Bayer, Baroda, India), a three part differential analyser, revealed a haemoglobin of 99 g/litre, a total leucocyte count of $273 \times 10^9$ cells/litre, and a platelet count of $156 \times 10^9$ cells/litre.

Figure 1 - Non-nucleated basophilic fragments of lymphoblasts. Note that these fragments have a size comparable to that of platelets. Leishman stain; original magnification, $\times 1000$. Note the cytoplasmic blebs being shed off from a blast (insert).

some of them in the process of being shed off, thereby supporting our speculation. Although automated platelet counts are generally precise even at low numbers, inaccuracies can be introduced when analysing blood with unusual characteristics. Extreme microcytosis of red blood cells as seen in HbH disease, microangiopathic haemolytic anaemia, and red cell fragmentation in burns can cause spurious rises in automated platelet counts. Occasionally, increased platelet counts can be caused by other particles with a similar size to platelets.

These include fragments of white blood cell cytoplasm—and this phenomenon has been documented in acute leukaemia, hairy cell leukaemia, and lymphomas—or extraneous particles such as bacteria, fungi, or yeast.

Technological advancements in automated haematology analysers have seen the demise of the age old practice of a blood smear examination for most samples. As evidence on spurious data generated by these instruments increases, blood smear examination is regaining its importance as a vital tool in haematology reporting. This is especially true for samples with abnormal characteristics that are flagged. Samples that are not flagged, but still show qualitative abnormalities are few and far between, and do not justify a blanket blood smear review.

Awareness of spurious automated results and a review of peripheral blood smears in samples from patients in whom results do not conform to the clinical profile can assist greatly in preventing inappropriate management.

Sufficient data on spurious results related to automated haematology analysers now exists. There is a need for users of automated data to be aware of the potential sources of error on these otherwise reliable instruments.

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References

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J Clin Pathol 2005 58: 224

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