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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 can 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 patients, along with blood smear examination.

A 10 year old boy presented with fever and lethargy of two week’s duration. He was pale, and had cervical and axillary lymphadenopathy, with moderate hepatosplenomegaly. The patient had a three part differential analyser, and had cervical and axillary lymphadenopathy. He had a blood smear review.

In addition, the blood smear showed 92% blasts with a platelet count of 156 \times 10^9/litre compared with the automated platelet count of 109 \times 10^9/litre, a discrepancy of 109 \times 10^9/litre, and 103 \times 10^9/litre. A picture (in the microscope) is worth a thousand words. Blood 2004;103:367-8.

**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 advances in automated haematology analysers have seen the demise of the age old practice of a blood smear review 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.

**References**


**Book Review**

Clinical Chemistry. 5th Edition


This well known textbook now appears in its 5th edition with an additional writer. The added colour has helped to produce a very readable book, with well laid out text and useful diagrams. It covers widely the curriculum needs of medical students as well as clinical scientists and other health care professionals. The use of case histories gives the book clinical relevance and the tables provide clear aide memoires for exam candidates. One criticism would be that I would like to have seen more detailed descriptions of how to investigate patients with biochemical problems.

Martin Crook

**Calendar of Events**

**Diagnostic Histopathology of Breast Disease**

9–13 May 2005, Hammersmith Hospital and Imperial College, London, UK

Further details: Wolfson Conference Centre, Hammersmith Hospital, Du Cane Road, London W12 ONN, UK. (Tel +44 (0)20 3835 3117/3227/3245; Fax +44 (0)20 3835 2428; e-mail wcc@ic.ac.uk)
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