Correspondence

Flow cytometry and Kleihauer tests

The paper by Johnson *et al*[1] shows the potential value of flow cytometry in accurate measurement of large fetomaternal haemorrhages (FMH). There is, however, an inherent potential bias in their study which could exaggerate the savings in anti-D. Essentially, they compared a single, central, specialised unit's measurements obtained by sophisticated technology with those from multiple, local units' use of a less sophisticated method. The illustration of potential savings of anti-D in table 3 relies on the local units' original Kleihauer results. To some extent this problem could be "controlled" by quoting in table 3 the central and reviewed, rather than (or in addition to) local and original, Kleihauer estimates of FMH. This might provide a more realistic view of the differences between the two technologies by removing the local methodological variability, which is so clearly illustrated in table 2, without overly diluting the message. For example, it seems from fig 2 that the original Kleihauer volume of 254 ml (patient 1 in table 3) might have had a reviewed Kleihauer volume somewhat closer to 100 ml, but it is hard to be sure from the figure and it is not stated whether this result was one of those reviewed in any case. Nevertheless, Johnson *et al* do quote a noticeably improved correlation between reviewed ("corrected") Kleihauer and flow cytometry estimates of FMH ($r=0{\cdot}915$). While acknowledging that it is premature to draw too many conclusions, I am not clear at present whether the message is (or might yet be) to centralise Kleihauer measurements of FMH, change the technology, or both, in cases with apparently "large" FMH. The main aim would be to prevent inappropriate/excessive use of anti-D in such cases. Just how excessive is still a little uncertain from this study. Experience with flow cytometry and NEQAS studies in leukaemia cell surface marking suggests that there can be wide variations, even between specialised centres. Similar variations might yet be found in flow cytometric measurements of FMH and one awaits the results of such comparative studies with interest. In those with undetectable fetal cells by flow cytometry, the point about maternal HbF is well made. I am a little confused about what is meant by probable Rh D negative fetuses. Were they not grouped after birth or did they abort in circumstances such that grouping was not possible?

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1 Johnson PRE, Tait RC, Austin EB, Shwe KH, Lee D. Flow cytometry in diagnosis and management of large fetomaternal haemorrhage. *J Clin Pathol* 1995;**48**:1005–8.

Drs Johnson and Tait comment:
In our paper, we calculated estimated savings of anti-D on the basis of the local hospital Kleihauer result as this is the method in practice in all hospitals in our region. The reviewed Kleihauer results certainly showed improved correlation with the flow cytometry estimate, but the basic drawbacks of the Kleihauer test in relying on HbF containing cells to define red cells of fetal origin discussed in the paper remain.

The message of our paper is threefold: (1) the Kleihauer test, as currently carried out in routine laboratories, is poorly standardised; (2) the Kleihauer test has inherent flaws, particularly in situations of raised maternal HbF; (3) flow cytometry, which may be organised at a regional level, may improve the accuracy of quantitation where the result of a Kleihauer test carried out locally suggests a large FMH, resulting in worthwhile reductions in the use of anti-D, and may also be helpful in cases of suspected false positive Kleihauer tests.

The "probable Rh D negative fetuses" were a therapeutic termination for multiple fetal abnormalities at 18 weeks and an intra-uterine death at term; neither were Rh typed.

We agree that NEQAS studies of both Kleihauer testing and flow cytometry in this situation are warranted.

Notices

A two-day course in

Haematology Morphology

will be held at

St Mary's Hospital Medical School
on
1–2 April 1996

This course, which includes both lectures and work at individual microscopes, is suitable for updating career grade post holders in haematology and is also valuable for trainees in haematology. **40 places only, CME approved (6 + 7 CME credits).**

The cost is £120 including lunches or £105 without lunches.

Please can you inform us if you require vegetarian meals when you register.

Those wishing to participate should apply in writing, enclosing a cheque **PAYABLE TO IMPERIAL COLLEGE** for the appropriate amount and sent to: Dr B J Bain, Department of Haematology, St Mary's Hospital Medical School, Norfolk Place, London W2 1PG. Tel: 0171 723 1252 ext 5595; fax: 0171 724 7349.

Fourth International Conference on Small Cell Lung Cancer

April 25 and 26 1996

Venue: Palazzo Mauro de André, Ravenna, Italy

For more information, please contact: Nadia Colaiuda, CMP, CMM, Augustea Srl, Via di Roma 86, 48100 Ravenna, Italy. (Tel: +39 544 216 313; fax 39 544 216 270.)

A one-day course in

Histopathology of the Bone Marrow

will be held at

St Mary's Hospital Medical School
on
Wednesday 3 April 1996

This course is for Consultant Haematologists, Consultant Histopathologists and advanced trainees in Haematology and Histopathology. **40 places only, CME approved (7 CME credits).**

The cost is £80 (light lunch included).

Please can you inform us if you require vegetarian meals when you register.

Those wishing to participate should apply in writing, enclosing a cheque **PAYABLE TO IMPERIAL COLLEGE** for the appropriate amount and sent to: Dr B J Bain, Department of Haematology, St Mary's Hospital Medical School, Norfolk Place, London W2 1PG. Tel: 0171 723 1252 ext 5595; fax: 0171 724 7349.

Diagnostic Cytopathology

The University of Birmingham

April 15–19 1996

Course Director: Dr Jennifer Young

A five day intensive course designed for trainee pathologists preparing for the MRCPath examination, candidates for the Diploma in Cytopathology of the Royal College of Pathologists, and consultant pathologists desiring further experience in cytopathology.

Subjects covered include serous fluids, respiratory and gastrointestinal tracts, development and technique of fine needle aspiration cytology, FNAC of breast, lymph nodes, thyroid, salivary glands, liver–biliary system, pancreas, upper and lower urinary tract and prostate, brain smears and CSF, soft tissue, bone and skin, imprint and scrape cytology as an adjunct to frozen section, special techniques, and self-assessment cases.

Superior accommodation with ensuite facilities available.

For further information please contact: Dr J A Young, The University of Birmingham, Department of Pathology, The Medical School, Edgbaston, Birmingham B15 2TT. Tel: 0121 414 4002; office: 0121 414 4017; fax: 0121 414 4019.

FNA Cytology using the Cytospin method

October 9 1996

Venue: Royal Preston Hospital, UK

This course, costing £60.00 to include coffee, lunch and tea, is aimed at Consultants and trainees, and MLSOs involved in Cytopathology.

For further information, please contact: Dr A J Howat, Department of Histopathology, Royal Preston Hospital, Preston PR2 4HG, UK. Tel: 01772 710141; fax: 01772 710181.