Findings from the UK NEQAS for Leucocyte Immunophenotyping Haematological Malignancy Bone Marrow Aspirate Assessment Programme

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INTRODUCTION

Assessment of bone marrow aspirates is an important part of the haemato-oncology diagnostic pathway. In 2018 UK NEQAS for Leucocyte Immunophenotyping (UK NEQAS LI) introduced the Haematological Malignancy Bone Marrow Aspirate Assessment programme. This programme is intended for both clinicians and laboratory staff working in the area of haemato-oncology and is designed to assess their ability to examine a bone marrow aspirate and report their findings.

AIM

The aim of this retrospective study was to assess the level of consensus achieved for historical exercises and determine whether participant consensus was showing improvement over time.

METHOD

The programme issues participants with a digital bone marrow aspirate image (figure 1) on which they are required to enumerate the percentage of blast cells, identify 5 pre-selected cells, and provide commentaries on the cellularity of the aspirate, haematopoiesis and presence/absence of dysplasia.

To date there have been eight exercises issued in this programme.

In order to assess whether the levels of consensus seen were improving over time a retrospective analysis of the results submitted was performed for each parameter covered by the external quality assessment (EQA) programme. As the assessment of cellularity, haematopoiesis and dysplasia was not requested in the first exercise issued it was only possible to examine this section of the EQA for 7/8 exercises, whereas all other parameters were assessed over the course of all 8 exercises.

RESULTS

For the enumeration of blast cells, analysis of the results submitted for the 8 exercises issued so far found -

- In 5 of 8 exercises all respondents were within 10% of the consensus value, with 2/6 participants outside of this limit for exercise 171802 and 1/21 outside this limit for exercise 181902
- Greatest variation was seen in exercise 192002, a B-cell prolymphocytic leukaemia, which gave two major groups of responses with blast percentages of 0% to 10% reported by 8/22 (36.4%) of participants and an identical number reporting a range of 81% to 90%

For the identification of pre-selected cells -

- 100% consensus was only seen in 10/40 of the pre-selected cells (5 cells per exercise and 8 exercises issued)
- Using a consensus level of >50% found that 37/40 pre-selected cells were identified successfully
- No consensus was reached for Exercise 192001 (RAEB-1) cells B & E and Exercise 192002 (B-PLL) cell C (figure 2)

When reviewing the results returned for the 7/8 exercises requesting the assessment of cellularity, haematopoiesis and dysplasia -

- For cellularity and haematopoiesis a consensus level of >50% was seen in every case
- 100% consensus for cellularity and haematopoiesis was seen in three out of the seven cases
- Dysplasia results showed no instances of 100% consensus, however 6/7 exercises showed consensus of >50% participant
- Consensus of >50% was not reached exercise 181903- B-cell prolymphocytic leukaemia

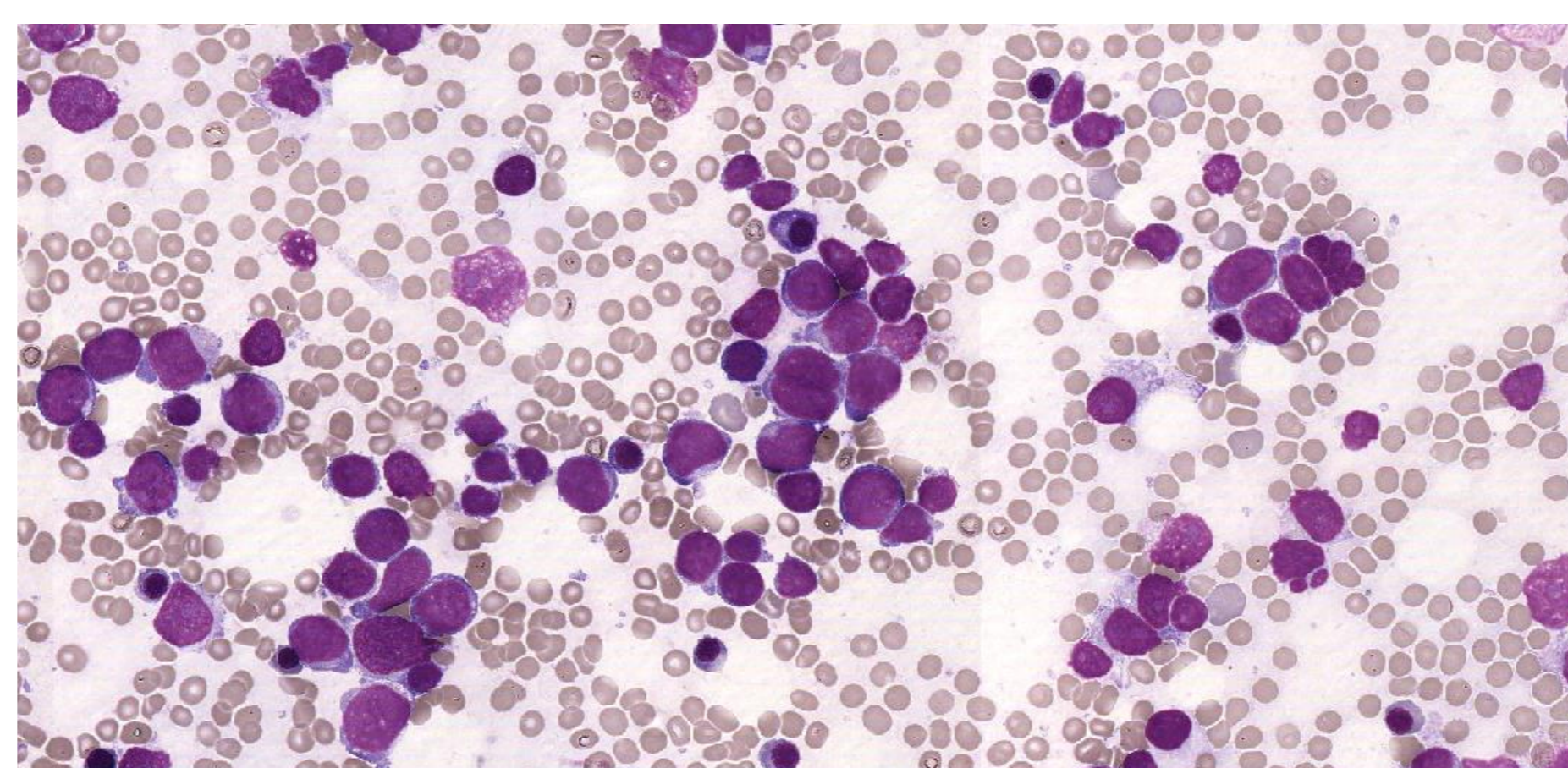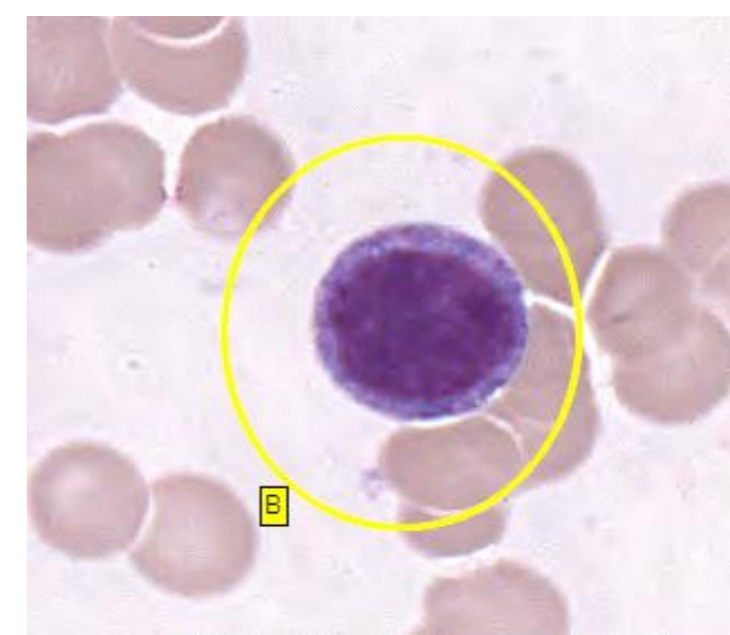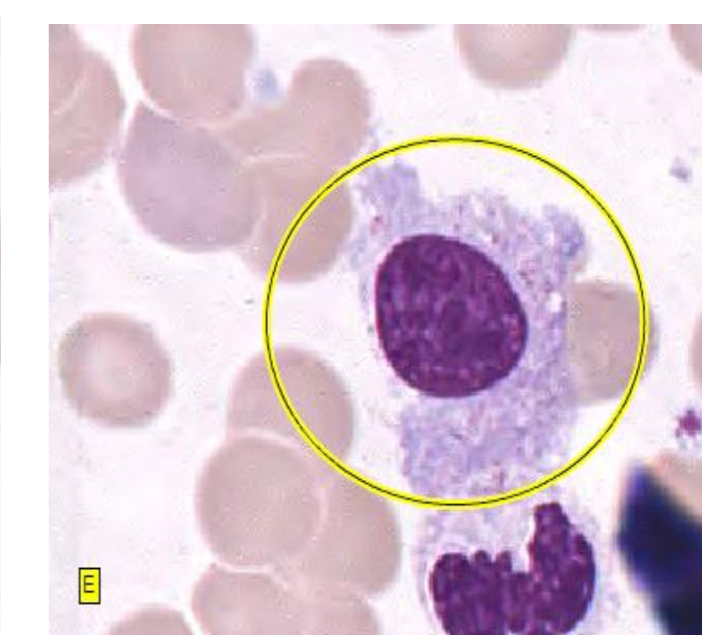Figure 1 - Example of digital bone marrow aspirate image

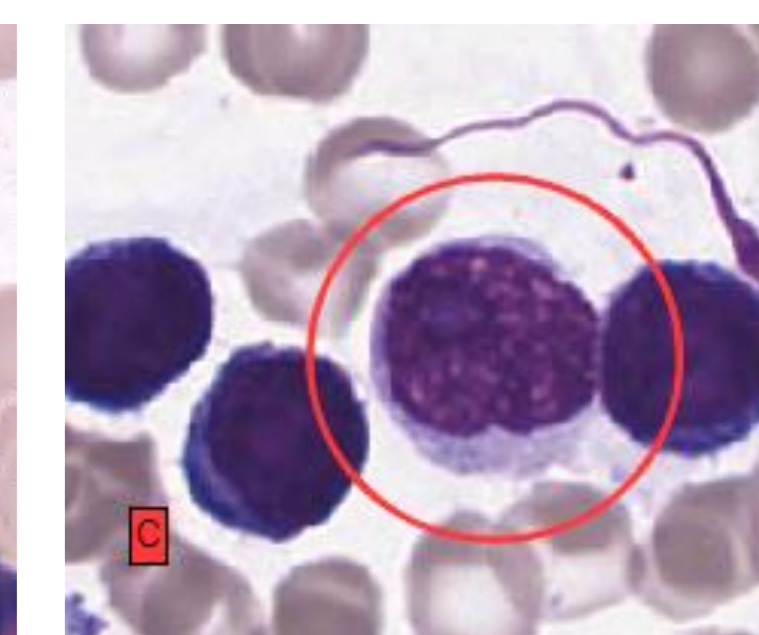Figure 2 - Images of the 3 cells where a consensus of >50% was not reached

Exercise 192001 Cell B

Exercise 192001 Cell E

Exercise 192002 Cell C

CONCLUSIONS

No discernible improvement or fall in consensus results was observed. Variation was seen in blast cell number counting, cellular identification and assessment of bone marrow aspirate cellularity, haematopoiesis and dysplasia.

However, throughout the exercises studied the number of participating scientists and medical staff continually varied, as such a future re-examination of submitted data will be undertaken when participant numbers have stabilised.

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