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Gut. Published Online First: 8 May 2008. doi:10.1136/gut.2008.153494
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Paper

Automated immunochemical quantitation of haemoglobin in faeces collected on cards for screening for colorectal cancer

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Accepted 29 April 2008

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Abstract

Background: Simple card collection systems are becoming available for faecal immunochemical tests (FIT) as well as guaiac faecal occult blood tests (gFOBT). FIT are now obtainable that allow quantitation of haemoglobin, so that the analytical detection limit can be set to give a positivity rate that is manageable in terms of the available colonoscopy. A combination of a card collection device and an automated FIT analytical system could be advantageous.

Methods: The quantitation of haemoglobin in samples collected on cards with a new analytical system and the relationship between faecal haemoglobin concentration and pathology were investigated in a cohort of gFOBT positive individuals.

Results: All groups had large ranges of haemoglobin concentration and there was overlap between the groups. Median haemoglobin concentrations in participants with normal findings on colonoscopy (167), diverticular disease (43), hyperplastic polyps (41), low risk adenoma (63), higher risk adenoma (35) and cancer (27) were 13.5, 15.6, 16.8, 15.2, 65.6

and 168.9 ng/ml haemoglobin respectively. Those with diverticular disease, hyperplastic polyps and low risk adenoma were not significantly different to the normal group ($P > 0.2$) but those with higher risk adenoma had significantly higher concentrations ($P < 0.001$) as did those with cancer ($P < 0.001$). ROC analysis demonstrates that the cut-off concentration can be set to give appropriate clinical characteristics; optimum sensitivity and specificity are achieved at 26.7 ng/ml.

Conclusions: The haemoglobin in faeces on simple FIT card collection devices can be immunoturbidimetrically analysed quantitatively and the concentration relates to the presence or absence of significant neoplastic disease.

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