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Potential inaccuracy of finger prick blood samples

Sir,

I was recently involved in a case which illustrates that blood glucose results from a finger prick test can be misleading.

A four and a half year old insulin dependent diabetic girl was given a bolus of glucose gel and some milk to treat what was thought by her mother to be a hypoglycaemic episode. One hour later a finger prick test showed the capillary blood glucose level to be in excess of 22 mmol l⁻¹ but there had been no improvement in the child's condition. The children's ward at the hospital was telephoned for advice regarding the need for insulin. There was concern that the glucose bolus, which had been administered without first confirming hypoglycaemia, had aggravated pre-existing ketoacidosis. Immediate admission for assessment was advised.

On admission the child was apyrexial, drowsy and irritable. She was hyperventilating but there was no ketotic fetor. The capillary blood glucose level was again found to be in excess of 22 mmol l⁻¹. A blood sample was sent for urgent laboratory testing.

In anticipation, a fluid regimen was calculated and an insulin infusion was prepared to treat the presumed hyperglycaemia. However, laboratory results revealed normal blood gases and serum electrolytes, and a blood glucose of only 2.1 mmol l⁻¹. Because of this, the capillary blood glucose measurement was repeated on the ward, but blood was taken from the child's foot rather than the finger, after thorough skin cleansing. The reading correlated well with the laboratory result.

Detailed enquiry to establish a reason for discordance between capillary and laboratory results revealed that the child had vomited after being given the glucose bolus, leading to contamination of both hands. Failure to clean the skin prior to performing the finger prick test for capillary glucose level yielded falsely elevated readings both at home, and on admission to hospital. Anyone involved in the care of diabetic patients should be aware that the

accuracy of results is dependent on many factors¹ including skin cleanliness.

Isolated carers managing diabetic patients in the community rarely have access to laboratory facilities on which to base their clinical management in an emergency. They should be especially careful to question the accuracy of capillary glucose results before deciding on treatment.² Inaccurate results can lead to inappropriate and potentially damaging treatment being started.¹

DAVID A COOKE

Princess of Wales Hospital
Bridgend
Mid Glamorgan

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Research, audit and postgraduate education

Sir,

The recently completed first United Kingdom national asthma attack audit project has implications for attempts to link audit, research and postgraduate study. General practitioners were asked to record details of all asthma attacks which occurred in their patients over a predetermined three month period. The major objective of the project was to research the frequency and management of asthma attacks in the community.

To assist with the recruitment of general practitioners the project was linked to a distance learning programme accredited for the postgraduate education allowance. The experience of linking research and audit to postgraduate study proved valuable and may serve as a model for other projects.

All of the 218 general practitioners who returned research data on their patients who had asthma attacks were sent materials for a distance learning programme.

The programme was free, was in two parts and gave general practitioners individual comments and a critique on how each asthma attack had been managed. General practitioners were asked to formulate an action plan based on how they had managed asthma attacks compared with British Thoracic Society guidelines and the critique. The distance learning package was highly rated by participants who emphasized they felt the programme was highly relevant to their work. A surprising finding was that only 102 of the 218 eligible participants (47%) completed the distance learning package and claimed postgraduate education allowance accreditation (half a day in disease management). The paradox of a highly rated programme with a modest uptake may suggest participants had already accrued sufficient days for the postgraduate education allowance.

There may be lessons for future studies of this type. It is feasible to link a postgraduate educational package to research projects. This can aid recruitment and thus offer participants an incentive, albeit modest, to take part. Linking an educational activity to research and audit based on actual clinical cases may have a beneficial effect on patient care.

We should be interested to hear from others who have experiences or comments on trying to link research, audit and postgraduate education in this way.

RONALD G NEVILLE
GAYLOR HOSKINS
BARBARA A SMITH
ROLAND C CLARK

GPIAG Research Unit
Department of General Practice
University of Dundee
Westgate Health Centre
Dundee DD2 4AD

Estimating date of delivery

Sir,

We were interested to read the paper by Rowlands and Royston determining whether the last menstrual period or the ultrasound scan was the more accurate