Unsuitable blood glucose measuring devices in neonatal or paediatric acute care

To the Editor: In acute neonatal or paediatric care, bedside blood glucose measurement is aimed predominantly at identifying hypoglycaemia, but high readings prompt the suspicion of diabetes mellitus or the stress hyperglycaemia of critical illness, in which high blood glucose levels correlate positively with poorer outcome.1

A recent case has reminded us that bedside glucose testing is not always specific for glucose only.2

A 13-day-old girl presented with persistent neonatal jaundice, profound micro-angiopathic haemolytic anaemia, a grossly prolonged prothrombin time and a white cell leukaemoid reaction of 53×10⁹/l. Escherichia coli was cultured from the urine, and the patient responded to antibiotics. Blood glucose monitoring with Accu-chek glucose meter (Roche Diagnostics) test strips gave persistently high readings. The absence of glycosuria and a comparison with laboratory blood glucose values alerted us to the fact that the readings were falsely elevated. This was due to a high blood galactose level in this patient, in whom the diagnosis of galactosaemia due to transferase deficiency was subsequently confirmed. We had failed to appreciate the fact that the glucose dye oxidoreductase mediator reaction (glucose dehydrogenase) as used in the Roche Accu-chek also measures galactose.3

Previously, in a comparison of point-of-care glucose meters Newman et al.4 had found the Roche Accu-chek to give equimolar interference of galactose with glucose and therefore to risk gross overestimation of glucose in cases of galactosaemia.

A normal blood galactose level (<0.44 mmol/l) is not high enough to result in clinically significant elevation of the combined blood glucose and galactose level. However, permanent or transient elevation of blood galactose is found in galactosaemia, liver dysfunction or maturational delay of galactose transport or utilisation,5 and then can indeed affect measurements and clinical judgement. The present case illustrates this risk to the detriment of the patient.

We conclude that the Accu-chek glucose meter is not suitable as a blood glucose measuring device in neonatal or paediatric intensive care units wherever elevation of blood galactose levels cannot be excluded a priori, and should be removed from routine use in such areas.

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