Short reports

An inaccurate blood glucose measurement: a sugar-coated diabetic

The standard response to the arrival of an unconscious diabetic in an accident and emergency (A&E) department is to perform an instant assessment of the blood glucose which is commonly achieved using a blood glucose testing strip ('Dextrostix', 'Glucostix' etc.). It has been widely recorded that this method may produce inaccuracies from various user errors.^{1,2} This report describes a previously unreported error in the measurement of blood glucose with a testing strip.

A 22-year-old male was brought to the A&E department in an unconscious state [Glasgow Coma Score (GCS) of 5]. His wife informed the attending doctor that her husband had been an insulin-dependant diabetic for 20 years and had experienced frequent hypoglycaemic episodes. Blood glucose was measured on arrival using a standard technique with a BM-Test 1–44 test strip from the right index finger. The result was 17 mmol L⁻¹. A cannula was inserted in the left arm and blood taken for serum electrolytes and glucose. In view of the history a second measurement was requested from a drop of blood taken from the cannula. This second recording was 1 mmol L⁻¹ and treatment was commenced with 50 mL of 50% dextrose intravenously. The patient's recovery was prompt and complete to a GCS of 15. When questioned, the patient stated that, on recognizing the onset of hypoglycaemia, he attempted to pour himself a drink of 'Lucozade' which spilt over his right hand as his condition deteriorated.

The measurement of blood glucose using a finger prick technique is a common practice in all A&E departments and should be performed on all patients who attend in an obtunded state. Inaccuracies can result from many factors including poor technique and poor care of the strips. If hypoglycaemia is suspected clinically then a bolus dose of 50% dextrose should be given whatever the result of the strip test. Immediate recovery proves the diagnosis to be correct. In this

case as the cannula was inserted a further specimen was obtained and measured prior to the dextrose solution being given.

The contamination of the original sample with Lucozade 'which was on the patient's hand, is an unreported complication of the use of testing strips for blood sugar estimation. All blood glucose test strip manufacturers recommend that the test site be cleaned with a non-alcohol cleaner prior to the sample being taken. In practical terms this is frequently omitted but if gross contamination is apparent then consideration of alternative sites such as the ear or great toe should be made. Lucozade is a glucose drink containing a mixture of complex carbohydrates including pure glucose with a total carbohydrate content of 18.7 g 100 mL⁻¹. Its use in the emergency correction of hypoglycaemia in diabetics is recommended by the manufacturers, 50 mL of Lucozade providing the equivalent of a 10 g carbohydrate exchange.³ Experimentally, in a pure state, it reacts with a BM-Test 1–44 test strip giving a value of greater than 44 mmol L⁻¹ (personal observation).

This case outlines that a clinical diagnosis of hypoglycaemia should prevail even with an apparently spurious result and appropriate treatment should be instituted. Laboratory assessment of a venous sample should be used to finalise the diagnosis.

REFERENCES

1. Wiener K. (1990) Attention to protocol. *Medical Laboratory World* Nov., 10–12.
2. Hindley P. (1989) Monitoring diabetes at home: what the patient needs to know and the equipment necessary. *Practical Diabetes*, 6, 59–61.
3. SmithKline Beecham Consumer Healthcare, Nutrition Section (1994) Lucozade Product Information Sheet.

J. WHITTAKER
Accident and Emergency Department, Alder Hey
Hospital, Liverpool