Lesson of the Week

Misdiagnosis of diabetic ketoacidosis as hyperventilation syndrome

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"Air hunger" is a classical symptom of diabetic ketoacidosis and was originally described by Kussmaul in 1874.[1] We report three cases in which breathlessness and panic symptoms were the main presenting complaints in ketoacidosis. In all three cases an incorrect diagnosis of hyperventilation syndrome was made initially with a consequent and serious delay in the diagnosis of diabetes. So far as we know this is the first report of this diagnostic error, which may be more frequent than is currently appreciated.

Diabetics may present with atypical symptoms leading rapidly to a metabolic emergency; hence urine analysis for glucose must be performed in all patients with any newly presenting problem, both in general practice and in hospitals

Case reports

Case 1—A 52 year old woman presented to the accident and emergency department with a three day history of panic attacks, palpitations, and breathlessness. In the past she had been treated for depression. Hysterical hyperventilation was diagnosed and diazepam prescribed and she was referred to a psychiatrist. Three days later she returned. In addition to her original symptoms she complained of weight loss, polyuria, and dysuria. Laboratory investigations showed a blood glucose concentration of 32·6 mmol/l and an arterial pH of 7·2. She was treated for diabetic ketoacidosis and recovered uneventfully. She continued with insulin injections and had no further "panic attacks."

Case 2—A 24 year old woman attended the accident and emergency department complaining of breathlessness, faintness, and weight loss. She had recently been suffering from depression and had attended another hospital the previous day, where she had been referred to a psychiatrist. On this occasion hysterical hyperventilation was diagnosed. She was made to rebreathe exhaled air and given an outpatient psychiatric appointment. Two days later she returned. She was semiconscious, dehydrated, and hypotensive. Laboratory investigations showed a blood glucose concentration of 58 mmol/l and an arterial pH of 6·99. Diabetic ketoacidosis was diagnosed and appropriate treatment instituted. She recovered and left hospital taking insulin. She remained well.

Case 3—A 34 year old woman presented complaining of an infected leg wound and breathlessness. The diagnosis was an infected catbite and hysterical hyperventilation and she was prescribed diazepam and antibiotics. Two days later she was brought to the department unconscious. An infected wound to the right thigh was noted and she was hypotensive and hypothermic. Results of laboratory investigations were: blood glucose concentration 45 mmol/l, arterial pH 6·75, serum sodium concentration 128 mmol/l, blood urea concentration 27·2 mmol/l, and potassium concentration 6·8 mmol/l. A diagnosis of diabetic ketoacidosis with possible septicaemia and a groin abscess was made. She was treated with intravenous fluids, insulin, and antibiotics and the abscess drained. Dialysis was required for three days for acute renal failure. She recovered and remained well taking insulin injections.

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Discussion

Delay in the initial diagnosis of diabetes is common, many patients seeking medical attention on several occasions before the diagnosis is finally made. Usually delay occurs because symptoms have been misinterpreted by doctors.[2 3] In our patients presenting complaints were of breathlessness and "panic" symptoms, which led to the inappropriate diagnosis of hyperventilation syndrome.

It has been suggested that hyperventilation syndrome is more common than previously realised,[4 5] which in turn may lead to a tendency to overdiagnosis. The risk of overlooking organic illness in a patient with an incorrect diagnosis of hyperventilation syndrome has been noted,[6] and it is unwise to make such a diagnosis on the basis of the history alone.[7] Though early descriptions of the syndrome concentrate on cardiovascular symptoms,[8 9] recent reviews suggest that the range of complaints attributable to hyperventilation is large, including nausea, fatigue, blurred vision, and even frequency of micturition[10 11]—symptoms which could well be due to uncontrolled diabetes.

The initial erroneous diagnosis of a psychiatric illness caused serious delay in starting treatment in all three patients. The assumption that a psychological disorder was present led to the dangerous omission of physical examination, basic nursing observations, and urine analysis. In all these patients a simple test for glycosuria would have made the diagnosis obvious and the consequent and considerable risk to the patients could have been avoided.

References

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