ABC of Diabetes

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HYPOGLYCAEMIA

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HYPOGLYCAEMIA ("hypo" "insulin reaction")

This is when the blood sugar goes too low in diabetics taking insulin.

Symptoms are sweating, shaking, tingling round the mouth, hazy eyesight or seeing double, slow thinking, in children naughtiness.

Causes are late meal, too little carbohydrate, extra exercise, too much insulin.

Cure is to take carbohydrate - preferably 3 dextrosol tablets, glucose, sugar (2 large lumps), barley sugar, Lucozade.

Symptoms will soon wear off.

If in doubt about an attack, take sugar.

Always carry some form of SUGAR with you

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Hypoglycaemia is the major hazard of insulin treatment. Patients may experience the symptoms of hypoglycaemia when the blood concentration is less than 2.5 mmol/l but individual susceptibility varies considerably. The risks are small in most diabetics, but because they exist at all diabetics on insulin are barred from certain occupations such as driving trains or buses. All diabetics on insulin who are reasonably well controlled will experience hypoglycaemia at some stage. At its mildest it is no more than a slight inconvenience, but at its severest, when unconsciousness can occur, it is both a hazard and an embarrassment. Hypoglycaemia occurs infrequently in patients on oral hypoglycaemics.

All diabetics taking insulin must be carefully taught about the causes, symptoms, and treatment of hypoglycaemia. Ideally, new diabetics should be made to experience hypoglycaemia during their initial education.

Symptoms

Most diabetics experience the early warning symptoms of hypoglycaemia and can take sugar before more serious symptoms develop. With increasing duration of diabetes and in older patients there is a tendency for the early warning symptoms not to occur, and patients develop the more serious problems. Although this lack of warning has been attributed to autonomic neuropathy, I doubt whether this is generally the case, although beta-blocking drugs occasionally have this effect. Friends and relations are then more often aware of hypoglycaemia than the patient himself, observing him to be slow-witted with a vacant expression and perspiring face and hands: they should give him sugar immediately.

Diabetics who become unconscious from hypoglycaemia should be taken to hospital immediately. Brain damage and death do not usually occur because the blood glucose concentration tends to increase spontaneously as the effect of the insulin wears off. Many diabetics, especially children, need reassurance that they will not die in their sleep. Nevertheless, prolonged hypoglycaemia from insulin overdose can be fatal, and suicides and attempted murder with insulin have been reported.

Early warning	Shaking, trembling Sweating Pins and needles in lips and tongue Hunger Palpitations Headache (occasionally)
Neuroglycopenia: Mild	Double vision Difficulty in concentrating Slurring of speech
More advanced	Confusion Change of behaviour Truculence Naughtiness in children
Unconsciousness	Restlessness with sweating Epileptic fits, especially in children Hemiplegia, especially in the elderly (but rare)

Causes of hypoglycaemia

In every diabetic on insulin the blood glucose concentration shows peaks and troughs, which can be most clearly shown by home measurement of blood glucose. Since the lowest blood glucose concentrations, when the symptoms of hypoglycaemia are most likely to appear, occur at different times in each patient, it is a great advantage if individual patients know when their own troughs are likely to occur. The commonest times are before lunch and during the night.

Apart from the natural troughs in blood glucose concentrations, other events likely to provoke hypoglycaemic attacks are: insufficient carbohydrate in meals; delayed meals; physical activity; errors of insulin dosage; and changing from beef to pork insulin without appropriate reduction of dose. Really severe physical activity, such as swimming very long distances, is a powerful stimulus of hypoglycaemia, and as much as 40-50 g additional carbohydrate may be needed to prevent it.

Hypoglycaemia is particularly likely to occur shortly after stabilisation of new diabetics, as their insulin requirements may decline considerably; the insulin dose should therefore always be reduced before they leave hospital.

Hypoglycaemia is also troublesome when insulin requirements insidiously decrease at the onset of certain disorders, including Addison's disease, hypopituitarism, and malabsorption syndromes.

Treatment

Items containing 10g of carbohydrate	
Milk.....	1/3 pint
Lucozade.....	60 ml (4 tablespoons)
Ribena.....	15 ml (1 tablespoon)
Coca Cola.....	90 ml
Sugar.....	2 teaspoons
Sugar lumps (small).....	3
Dextrosol tablets.....	3

Dr Charles Fletcher's account of hypoglycaemia

My main problem has always been hypoglycaemia. At first I was nearly always aware of it by day and woke at night, because of the adrenaline response. But, particularly in the past 20 years, it gradually became more difficult. I may now feel normal and do ordinary tasks quite easily with blood sugar as low as 2.5 mmol/l (45 mg/100 ml). Sometimes diplopia, dysphasia, weariness, or inability to think may lead me to do a blood sugar. But I often become too muddled to know what is wrong, and I have had to thank my wife, my children, and many generations of housemen, registrars, and secretaries for spotting these low levels on many occasions. Before I retired 50% glucose was always available with syringe in a drawer in my desk. I became quite used to a quiet registrar's voice in outpatients (and elsewhere) saying, "I think, sir, a little intravenous glucose might help." Lucozade has been invaluable. I always have it available in the car, in the office, and at home. It is acceptably free from sugariness, it saves me chewing and choking on dry glucose tablets, and it is rapidly absorbed. My wife finds it much easier to get me to drink this than to take any other form of sugar when I am severely hypoglycaemic and refuse to acknowledge it. I have made it a rule, which I now keep, even when semi-comatose, that if my wife—or anyone else—tells me to take sugar I do so however sure I may be that I'm not hypoglycaemic. They have only been wrong on rare occasions. I am very sensitive to exercise, but for some reason I find it difficult always to suck prophylactic sweets on country walks or when digging or mowing in the garden.

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Prevention is most important. *All diabetics should carry on their person and in their cars either sugar lumps, sweets, or dextrosol tablets.* They should take ample carbohydrate at the times when their blood glucose troughs occur and extra carbohydrate before vigorous exercise such as swimming or football.

If the early warning symptoms occur (table) they should take 10 to 20 g sugar immediately. If the response is poor more can be taken. Unconscious patients should be given intravenous glucose (20-50 ml of 50% glucose) in hospital after blood has been taken for confirmatory analysis later. At home they can be given an injection of glucagon (1 mg intramuscularly), which quickly raises the blood glucose. It may be very helpful and a great comfort to the relations of diabetics who are liable to become unconscious from hypoglycaemia to keep glucagon in a convenient place.

Patients who remain unconscious after prolonged hypoglycaemia are sometimes given treatment for cerebral oedema with intravenous mannitol and dexamethasone. They usually recover. It is very important to be certain of the correct diagnosis of unconsciousness.

Management of patients with recurrent disabling hypoglycaemic episodes is described in the article on the unstable insulin-dependent diabetic.

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