ACUTE HYPOGLYCAEMIA
Supporting information

This guideline has been prepared with reference to the following:

SIGN. Management of diabetes: a national clinical guideline. 2010 (updated 2017). Edinburgh. Scottish Intercollegiate Guidelines Network

http://www.sign.ac.uk/assets/sign116.pdf

Immediate treatment

Glucose 26 g or 3-4 lumps of sugar in 150 mL of water by mouth is appropriate immediate treatment for semi-conscious patients with acute hypoglycaemia and if there is no immediate response the same dose should be repeated after 10-15 minutes?
The use of oral glucose in the treatment of hypoglycaemia is mainly empirically based, and little is known about the time lag and size of effect following administration (Poulsen, 2000). The level of consciousness in the patient will determine whether glucose can be given safely by the oral route. Pickup and Williams suggest that, in the semi-conscious patient, jam, honey or a 40% glucose gel (Hypostop) can be smeared inside the mouth and the cheek massaged to promote mucosal absorption. In an experimental study involving 41 patients, Slama et al (1990) found no increase in blood glucose levels 10 minutes after administration of glucose gel, and recommended sugar lumps (15g) as the best and most economical choice, repeating the treatment after 15 minutes if necessary. European guidelines (1993) advise 10-20g of glucose repeated after 20 minutes if required.

European IDDM Policy Group. Consensus guidelines for the management of insulin-dependent (Type 1) diabetes. Diabet Med 1993;10:990-1005

Pickup J, Williams G. Textbook of diabetes, 2nd ed. Oxford, Blackwell Science, 1997. 40.18

Poulsen PL, Orskov L, Grofte T, et al. Effects of oral glucose on systemic glucose metabolism during hyperinsulinemic hypoglycemia in normal man. Metabolism 2000;49:1598-1603

Slama G, Traynard P-Y, Desplanque N, et al. The search for an optimized treatment of hypoglycemia: carbohydrates in tablets, solution, or gel for the correction of insulin reactions. Arch Intern Med 1990; 150:589-93

Evidence level: III

In unconscious patients with acute hypoglycaemia, IV glucose (100 ml of 20%) should be given as an appropriate initial treatment?
European guidelines (1993) recommend 20-30 ml of 30-50% IV glucose (or 1 mg im glucagon unless alcohol has been consumed). A study comparing IV glucagon and dextrose (Collier, 1987) found that 50 ml of 50% iv dextrose raised blood glucose levels from <1.0 mmol/l to 12.5 mmol/l within 5 minutes. In local practice, a 20% solution has been found to be much quicker and easier to handle, and equally effective when 100 ml is given.

European IDDM Policy Group. Consensus guidelines for the management of insulin-dependent (Type 1) diabetes. Diabet Med 1993; 10:990-1005

Collier A, Steedman DJ, Patrick AW, et al. Comparison of intravenous glucagon and dextrose in treatment of severe hypoglycemia in an accident and emergency department. Diabetes Care 1987;10:712-15

Evidence level: III

In patients who sustain acute hypoglycaemia as a result of excess doses of oral hypoglycaemic agents or an overdose of insulin, a continuing IV infusion of 5-10% glucose is appropriate?
Pickup and Williams (1997) mention that “continuous intravenous infusion of 5 or 10% dextrose may be necessary in patients who are unable to eat or who do not fully regain consciousness, and this may have to be maintained for many hours or even some days in patients with hypoglycaemia induced by long-acting sulphonylureas such as chlorpropamide.” Although no supporting references are given, this view is confirmed in a study of 13 patients by Sonnenblick (1986), who found that 2

patients were hypoglycaemic for more than 60 hours despite continuous IV infusion. Other studies by Roberge (1993) and Samuels (1989) have found similar results in cases of insulin overdose. Boyle (1993), in an experimental study on 8 normal volunteers, found that IV octreotide, given at 30ng/kg/min, was a safe and effective alternative to glucose in sulphonylurea overdose. Octreotide also avoided the need for the escalating quantities of hypertonic glucose required when glucose stimulates insulin release in the patient.
A 2013 review stated that the mainstay of treatment for insulin overdose is capillary blood glucose monitoring with IV glucose infusion (initially 10% glucose at 100-200ml/hr) (Eldred).

Boyle PJ, Justice K, Krentz AJ, et al. Octreotide reverses hyperinsulinemia and prevents hypoglycemia induced by sulfonylurea overdoses. J Clin Endocrinol Metab 1993; 76:752-6

Eldred AE, Mustafa OG, Hunt KF et al. Problem based review: the patient who has taken an overdose of long-acting insulin analogue. Acute Med. 2013;12:167-72

Pickup J, Williams J. Textbook of diabetes, 2nd ed. Oxford, Blackwell Science, 1997. 40.18

Roberge RJ, Martin TG, Delbridge TR. Intentional massive insulin overdose: recognition and management. Ann Emerg Med 1993; 22:228-34

Samuels MH, Eckel RH. Massive insulin overdose: detailed studies of free insulin levels and glucose requirements. J Toxicol Clin Toxicol 1989; 27:157-68

Sonnenblick M, Shilo S. Glibenclamide induced prolonged hypoglycaemia. Age Ageing 1986: 15:185-9
http://ageing.oxfordjournals.org/content/15/3/185.long

Evidence level: IV

Subsequent management

In patients who sustain acute hypoglycaemia as a result of taking chlorpropamide / glibenclamide, an IV infusion of glucose may need to be continued for several days before the risk of further hypoglycaemia can be overcome?

See evidence for previous question.

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