

## 1. Introduction

- A non-diabetic individual maintains their blood glucose level within a narrow range from 3.0 to 5.6 mmol per litre.
- This is achieved by a balance between glucose entering the blood stream (from the gastrointestinal tract or from the breakdown of stored energy sources) and glucose leaving the circulation through the action of insulin.
- This guideline is for the assessment and management of children with glycaemic emergencies <18 years.

## Section 1 – Hypoglycaemia

- Hypoglycaemia is the term used to describe low blood glucose levels.
- A low blood glucose level is defined as <4.0 mmol/l in children with diabetes and <3.0 mmol/l in non-diabetic children, but the clinical features of hypoglycaemia may be present at higher levels.
- Clinical judgement is as important as a blood glucose reading.
- Correction of hypoglycaemia is a medical emergency.
- If left untreated, hypoglycaemia may lead to the patient suffering permanent brain damage and may even prove fatal.
- Hypoglycaemia occurs when glucose metabolism is disturbed – see Table 3.82 for risk factors.
- Any child whose level of consciousness is reduced, who is having a convulsion or who is seriously ill or traumatised should have hypoglycaemia excluded.
- Signs and symptoms can vary from child to child (Table 3.83).

**Table 3.82 – RISK FACTORS FOR HYPOGLYCAEMIA**

### Medical – diabetic

- Insulin or other hypoglycaemic drug treatments.
- Tight glycaemic control.
- Previous history of severe hypoglycaemia.
- Undetected nocturnal hypoglycaemia.
- Preceding hypoglycaemia (< 3.5 mmol/L).
- Impaired awareness of hypoglycaemia.
- Increased exercise (relative to usual).
- Irregular lifestyle /supervision.
- Inadequate carbohydrate intake.
- Inadequate blood glucose monitoring.

### Medical – non-diabetic

- Very sick or traumatised children.
- Metabolic illness.
- Endocrine illness (including Addisonian crisis).
- Ketotic hypoglycaemia of infancy.
- Sudden cessation of tube or IV feeding.
- Sudden cessation of peritoneal dialysis.
- Very young babies (especially preterm).
- Hypothermia (especially in very young babies).
- Drug ingestion e.g. oral hypoglycaemic drugs, beta-blockers, alcohol.

- Some children are able to detect early symptoms for themselves, but others may be too young, or deteriorate rapidly and without apparent warning.

- Abnormal neurological features may occur, for example, one-sided weakness, identical to a stroke.
- Symptoms may be masked due to medication or other injuries.
- The classical symptoms of hypoglycaemia may **NOT** be present and children may have a variety of unusual symptoms with low blood glucose.
- In **DIABETES MELLITUS (DM)** hypoglycaemia is due to a relative excess of exogenously administered insulin over available glucose.

**Table 3.83 – SIGN AND SYMPTOMS**

### Autonomic

- Sweating.
- Palpitations.
- Shaking.
- Hunger.

### General malaise

- Headache.
- Nausea.

### Neurological

- Confusion.
- Drowsiness.
- Unusual behaviour.
- Speech difficulty.
- In-coordination.
- Aggression.
- Fitting.
- Unconsciousness.

## 2. Assessment and Management

For the assessment and management of hypoglycaemia refer to Table 3.84. The principles of assessment and management are essentially the same in diabetic and non-diabetic children and babies.

## Section 2 – Hyperglycaemia

- Hyperglycaemia is the term used to describe high blood glucose levels.
- Symptoms include unusual thirst (polydipsia), passing large volumes of urine (polyuria) and tiredness and are usually of slow onset in comparison to those of hypoglycaemia.
- Children with diabetes mellitus are very likely to develop a raised blood glucose in response to infection and will have instructions as to how to deal with this – so called ‘sick day rules’.
- Hyperglycaemia may also occur transiently in children who are severely physically stressed e.g. during a convulsion.
- It is important to distinguish a simple raised blood sugar from the condition of diabetic ketoacidosis which is much more serious (see below). A raised blood glucose is not a prehospital emergency unless diabetic ketoacidosis is present. (However, the underlying reason for the raised blood sugar may, of course, be an emergency in its own right.)