
Diabetes

Diabetes mellitus

Diabetes mellitus is a syndrome, mainly associated with an elevated concentration of sugar in the blood. Although this hyperglycaemia may occur only after ingesting food, and may pass without symptoms, the majority of sufferers must manage their condition carefully to avoid problems.

Causes

Diabetes mellitus is caused by a failure of the body to metabolise sugar from foods, either because of an insufficient level of the hormone insulin (from the β -cells in the islets of Langerhans in the pancreas), or because of a resistance of the body to its own insulin.

Types

Diabetes mellitus manifests itself in different ways, and may be classified according to the underlying cause.

Primary diabetes mellitus

Type 1

This is caused by a significant or total failure of insulin production.

The onset tends to be rapid, occurring mainly in young people (age 12-14 years), and will lead to a hyperglycaemic coma and death, unless treated.

The condition then lasts throughout the remainder of the sufferer's life.

Type 2

This is usually caused by an increased resistance of the body to insulin, thus lowering its effectiveness. Insulin production is almost normal, and may even be raised in early stages.

The onset is almost imperceptible, and tends to occur in older people, usually above the age of 50 years.

Some sufferers become obese because of the condition - some do not.

Gestational diabetes mellitus

This occurs during pregnancy, and passes after childbirth.

Secondary diabetes mellitus

Diabetes mellitus may result from a variety of other diseases, or even drug therapies, for example:

- Cushing's syndrome (a hormonal imbalance leading to obesity).
- Chronic pancreatitis.
- Hypokalaemia, produced by use of diuretic drugs.

Initial onset of diabetes mellitus

The onset of type 1 diabetes tends to be fairly rapid with obvious symptoms, whilst the onset of type 2 tends to be barely noticeable, and in some cases is only detected by an otherwise routine blood or urine test. In many cases, the sufferer will seek medical assistance before the condition reaches a crisis.

Signs & symptoms

- Persistent thirst.
- Much increased urine output.
- Elevated blood sugar, and sugar in the urine.
- Tiredness.
- Weight loss.
- Skin disorders - particularly boils and eczema.
- Vaginal infections.
- Impaired vision.
- Peripheral sensory nerve disturbances.

Treatment

No actual first aid treatment is possible. The sufferer must either be advised to seek medical attention, or they must be taken to Hospital.

Long term treatment of type 1 diabetes mellitus is by regular injections of insulin (insulin is destroyed by the digestive system, hence it cannot be taken orally), together with control of diet to regulate sugar intake.

Long term treatment of type 2 diabetes is by control of diet to regulate sugar intake, by the use of drugs to enhance insulin production, or by a combination of both.

Hyperglycaemic emergency

Hyperglycaemic emergencies are rare. They tend to occur if a sufferer of type 1 diabetes has missed an injection of insulin (for whatever reason), or has ingested considerable amounts of sugar, or sugar providing foods.

Signs & symptoms

- Dry flushed skin.
- Deep sighing breathing.
- Rapid pulse.
- Depressed temperature.
- Abdominal pain.
- Nausea, vomiting.
- Extreme thirst.
- Smell of acetone on the breath.
- Lethargy, restlessness, drowsiness.
- Elevated blood sugar level.

Without treatment, the casualty will gradually lapse into unconsciousness.

Treatment

If the casualty is conscious, and has insulin available, they should be encouraged to inject a dose. (In some cases, a parent or relative may have been trained to administer the dose).

If not, the summoning of medical assistance, or transport to Hospital, are the only options.

Hypoglycaemic emergency

Hypoglycaemic emergencies are more common than hyperglycaemic emergencies. They tend to occur if a sufferer of type 1 diabetes has injected too much insulin, has missed a meal, has taken unusually strenuous exercise, or a combination of these factors.

Signs & symptoms

- Pale skin with profuse sweating.
- Normal breathing, maybe shallow.
- Rapid, full pulse.
- Hunger.
- Headache.
- Dizziness.
- Uncoordinated, confused behaviour - an appearance of drunkenness.
- Aggression.
- Convulsions - in later stages.
- Falling level of consciousness.
- Reduced blood sugar level.

Measurement of blood sugar

British Red Cross protocols do not permit the taking of blood from a casualty, however, if the casualty has their own blood sugar measuring equipment (and is capable of carrying out the test), they should be instructed to take a measurement.

Treatment

If the casualty is conscious, they should be encouraged to eat or drink any available form of sugar. This will give a rapid improvement in condition. (The possible confused mental condition of the casualty, coupled with aggression, may render this task difficult, or even impossible).

(In some cases, a parent or relative may have been trained to administer a dose of glucagon - a hormone which causes sugar to be released from the liver).

Administration of dextrose gel

GlucoGel (formerly known as HypoStop) is a 40% dextrose gel - readily available in the UK.

GlucoGel is supplied in packs of three 25g tubes, or single 80g bottles. Each tube of GlucoGel contains 10g of carbohydrate. It is rapidly absorbed through the linings of mouth to give a rapid rise in blood glucose levels, with no side-effects.

GlucoGel use is indicated in known or suspected hypoglycaemia in a casualty who has a sufficient level of consciousness for there to be no risk of choking.

If the casualty is conscious and able to swallow readily, they should squeeze the tube of GlucoGel into their mouth and swallow. Alternatively, GlucoGel may be squeezed inside the cheek, and the outside of the cheek gently rubbed to aid absorption.

If there is a risk of choking, the GlucoGel may be squeezed onto a gauze swab and placed between the casualty's lips and gums from where it is absorbed.

Smaller doses should be given to children.

A second dose may be given if the first does not show effects after a few minutes (or if a blood sugar measurement shows no significant improvement).

If the casualty has been (or remains) unconscious, has shown significant signs and symptoms of hypoglycaemia, or does not improve within a few minutes of being administered sugar, transport them to Hospital.

Although the signs and symptoms of hyper- and hypo- glycaemic attacks are theoretically very different, it may sometimes be difficult to distinguish between the two. Also, signs & symptoms may be masked by other conditions, or by excessive intake of alcohol, etc.

If any doubt exists, sugar should be administered (when possible) followed by transport to Hospital if a rapid return to 'normal' does not occur.

Complications

Long term diabetes mellitus may give rise to other problems, such as:

- Deterioration of eyesight.
- Deterioration of blood vessels, especially to peripheral areas.
- Deterioration of sensory and autonomic nerves, particularly to lower areas of the body.

These complications may require special consideration when dealing with a diabetes mellitus sufferer.

Diabetes insipidus

Diabetes insipidus is a condition where the tubules in the kidneys fail to re-absorb water, and thus excessive water is removed from the circulation. The condition is totally different from diabetes mellitus.

Diabetes insipidus is caused either by a lack of antidiuretic hormone (secreted by the hypothalamus in the brain, and stored in the pituitary gland), or by a defect in the renal tubules preventing the action of antidiuretic hormone. The base cause may be genetic, or it may be a follow on from trauma or certain diseases. The use of some drugs may have similar effects.

Signs and symptoms are limited to excessive thirst and excessive production of weak, dilute urine.

Diabetes insipidus is not a condition which is likely to require first aid action other than a referral for medical attention if this has not otherwise been sought.