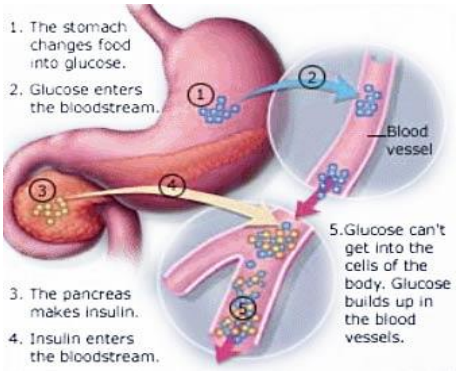
LexiMed
Medicolegal Specialists

Diabetes

Overview

Diabetes, also known as diabetes mellitus, is a group of metabolic diseases which cause a person's blood sugar or glucose levels to be too high, due to a malfunction in either insulin secretion or the body's response to insulin. Insulin is a hormone released by the pancreas to normalise glucose levels. When a person has diabetes, either the insulin is not produced by the pancreas, it is not produced in sufficient amounts or the cells of the body such as muscle cells are not very responsive to the insulin and therefore cannot absorb all of the glucose in the blood. These mechanisms can lead to poor regulation of glucose levels, causing elevated blood sugar levels, known as hyperglycaemia. Diabetes is usually a chronic condition meaning a person will have it for life and the impact can be very serious if it is not controlled properly.

What Happens?



The body converts glucose, which is a sugar and the body's main source of fuel, into energy. After a person ingests food, carbohydrates are broken down into glucose in the small intestine and the glucose is then absorbed by the intestinal cells into the bloodstream which transports the glucose to all the cells in the body to be used for energy. The pancreas secretes the hormone insulin into the blood, which regulates the uptake of glucose into most cells of the body, including muscle cells. Without insulin, the glucose cannot get into these cells, and this causes the blood sugar levels to increase. The cells become starved of energy and the body burns its own fats and proteins for energy leading to muscle wasting. Some organs, including the brain, can uptake glucose without insulin and this is important to ensure that the brain has sufficient energy from glucose to function at its best.

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Types of diabetes

Type	Description	Cause
Type 1 Diabetes	Also known as insulin dependent or juvenile onset diabetes, type 1 diabetes accounts for around 10% to 15% of all cases and usually starts before the age of thirty. With type 1 diabetes, the pancreas stops making insulin altogether.	For reasons not fully understood, the body's immune system which normally protects against disease and infection, attacks the insulin producing cells of the pancreas making it incapable of making insulin. The exact cause of this autoimmune response is not known, although there is a strong genetic link. It has not been found to be related to lifestyle choices.
Type 2 Diabetes	Type 2 diabetes is the more common type of diabetes, accounting for 85% to 90% of all cases. Historically it has been linked to older adults, although it is increasingly being diagnosed in younger adults, teenagers and children. With type 2 diabetes, the body still produces insulin, however the cells of the body are insensitive to insulin, and therefore some of the glucose cannot enter the cells. This initially results in high insulin levels in the blood, then eventually, the pancreas burns out and fails to produce sufficient insulin.	As with type 1 diabetes, the exact cause is unknown, although there is a strong genetic link, and environmental factors have been found to play a role. Risk factors include obesity, lack of exercise, and high blood pressure.
Gestational Diabetes	Gestational diabetes is characterised by elevated blood glucose levels during pregnancy, usually around the twenty fourth to twenty eighth week of pregnancy and occurs in between 3% to 8% of pregnancies.	During pregnancy, a woman requires two to three times more insulin than normal. Gestational diabetes will develop if the body is unable to cope with this higher requirement. Women who develop gestational diabetes are at risk of developing type 2 diabetes.
Pre-Diabetes	Pre-diabetes is also known as impaired glucose metabolism. Pre-diabetes is diagnosed in those that have blood glucose readings that are not high enough to be classed as diabetes, however, are not normal either.	Pre-diabetes is more common in people with relatives suffering from type 2 diabetes, and people with pre-diabetes are 10% to 20% more likely to develop type 2 diabetes than those with a normal blood glucose reading.

Symptoms and Diagnosis

Characteristics of diabetes are related to the build up of glucose in the blood and the lack of energy in the cells of the body. With type 1 diabetes, symptoms have a rapid onset within weeks or months, whereas type 2 diabetes progresses more slowly and sometimes has no symptoms at all for long periods of time.
Symptoms include:

- high urine frequency, as the body tries to get rid of excess glucose, leading to dehydration and thirst;
- weight loss, as the cells are not getting energy from glucose, the body begins to break down fat and tissue protein as an alternative energy source. This in turn causes an increase in hunger and tiredness; and
- changes in vision due to glucose getting absorbed into the eye.

A simple blood test can be used to diagnose diabetes. A fasting blood glucose test can be done after a person has not eaten for eight hours. Normal fasting blood plasma glucose levels are less than one hundred milligrams of glucose per decilitre of blood (mg/dl). If this test is abnormal, then the next step is usually an oral glucose tolerance test. Patients are given a very sugary drink and their blood sugar levels are measured before the test when fasted, and then two hours after the drink.

Treatment

Blood glucose monitor

Diabetes is not curable, however it can be treated. Treatment is aimed at maintaining normal blood glucose levels. For both type 1 and type 2 diabetes sufferers, eating a diabetic diet low in sugar is essential, as well as taking regular exercise and maintaining a weight within the range recommended for age and height. Type 1 diabetics must measure their blood glucose levels during the day with a blood glucose monitor and take insulin by a small injection just under the skin as required. The injection is usually self administered into the fatty tissue around the stomach or thigh, up to six times a day. Some chose to have an insulin pump which has an automated infusion process. This can be useful for children with type 1 diabetes. Pre-diabetics and some type 2 diabetics can control their diabetes by diet in the early stages. However as the diabetes progresses, this is not enough to control blood glucose levels so medication is recommended which is not insulin, however it acts to assist the body in controlling blood glucose levels. Eventually several types of medication and insulin may be required.

Prognosis

Prognosis depends on the type and severity of diabetes, and the management. In a poorly managed diabetes patient, prognosis is poor due to problems occurring with the kidneys and heart and circulation and sensation to their legs can be reduced due to glucose deposits in their arteries and nerves. Overall life expectancy is slightly reduced for diabetic patients although good management and maintaining a healthy lifestyle will reduce the impact of diabetes on life expectancy.

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Sources: http://www.diabetesaustralia.com.au/, http://www.medicinenet.com/diabetes_mellitus/article.htm, http://www.nlm.nih.gov/medlineplus/diabetes.html, https://kidshealth.org/en/kids/health-problems/gland?ref=search, , http://docakilah.wordpress.com/2012/02/03/dead-doctors-dont-lie-diabetes/,