



Diabetes Mellitus

Discussion paper prepared for
The Workplace Safety and Insurance Appeals Tribunal

March 2003

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This medical discussion paper will be useful to those seeking general information. It is intended to provide a broad and general overview of a topic and is written to be understood by lay individuals. Discussion papers are not peer reviewed and do not necessarily represent the views of the Tribunal. A vice-chair or panel may consider and rely on the medical information provided in the discussion paper, but the Tribunal is not bound by the discussion paper in any particular case. It is always open to parties to an appeal to rely on or distinguish a medical discussion paper, or to challenge it with alternative evidence.

DIABETES MELLITUS

1. Definition of Diabetes:

Diabetes Mellitus is a metabolic disorder characterized by a fasting plasma glucose greater than 7 mmol/L, or a 2 hr post-meal plasma glucose level greater than 11.1 mmol/L; these numbers greatly differentiate people at high and low risk for subsequent diabetic retinopathy (eye disease) and nephropathy (kidney disease).

Diabetes is a disease of unknown cause. It can present in different ways and its course is variable. According to current classification, most cases of diabetes can be classified as type 1 and type 2.

Type 1 diabetes is an autoimmune disease. The immediate cause of the disease is the destruction of the insulin-producing beta cells in the pancreas, a large gland located behind the stomach. Insulin is the most important blood sugar lowering hormone. It acts primarily on the muscle, fat tissue and liver. The loss of insulin production causes a rise in blood sugar and the appearance of sugar in the urine and an increase in urine output and fluid depletion which in turn increases thirst.

Type 2 diabetes: the initial defect is insulin resistance. Insulin resistance is compensated for by increased insulin production. In a later stage, the pancreas fails and insulin deficiency develops. At this stage of the disease insulin is needed to keep the blood sugar normal.

2. The causation of type 1 and type 2 diabetes:

- a. The cause of type 1 diabetes is unknown. It is believed that the insulin-producing beta cells are destroyed by an autoimmune process. The immune system protects the body against infections caused by microbes and viruses. Rarely, the same cells that attack the invading microbes turn against the cells of the body. The diseases caused by these mechanisms are called autoimmune. Type 1 diabetes is an autoimmune disease. There is evidence that heredity plays an important role in the development of type 1 diabetes.
- b. The cause of type 2 diabetes is unknown. Heredity predominates. Very important contributing factors are obesity and lack of exercise. The major modifiable risk factor in the development of type 2 diabetes is obesity.

3. The complications of diabetes:

- a. Diseases of the small blood vessels damaging the eyes and kidneys can cause blindness and kidney failure.
- b. Diseases of the large blood vessels causing narrowing and ultimately occlusion of the arteries in the heart, brain and legs resulting in heart attack, stroke and gangrene. The complications of diabetes can be to a large extent prevented or delayed by keeping the blood sugar as close to normal as possible and treating high blood pressure and high cholesterol. Smoking is absolutely contraindicated in both types of diabetes.

4. Stress and Diabetes:

Stress is an ill-defined but widely used and abused concept. It can be physical, i.e. an injury, an illness, e.g. infection, psychosocial e.g. death in the family or economic hardship. All of the above elicit a physiological response including the release of excessive amounts of so-called "stress hormones", i.e. adrenalin and cortisol. These cause temporary elevation of blood sugars in all individuals.

Stress can influence **all** chronic diseases including diabetes. Therefore, statements that an injury adversely influenced a disease process is possible, unprovable, but also irrefutable. One of the common problems for the Appeals Tribunal is to deal with the effect of an injury, be it major e.g. multiple fractures or minor e.g. lumbar strain without evidence of fracture or dislocation on a pre-existing chronic illness such as diabetes or high blood pressure. The injury and the associated pain are stresses that aggravate chronic diseases **temporarily**. Their long-term effect is unknown and there is no evidence that chronic stress alters the course of many of the common chronic diseases including diabetes. There is no acceptable scientific literature on this issue that I know of, and it is not surprising. Scientific studies require controls. The "after this, therefore because of this" reasoning is not acceptable.

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