

Diabetes mellitus is
caused by a
deficiency in



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Diabetes mellitus is caused by a deficiency in the secretion or action of insulin. Nearly six percent of the United States population shows some degree of abnormality in glucose metabolism indicative of diabetes or a tendency toward the condition. Diabetes mellitus is a group of diseases in which the regulatory activity of insulin is defective. There are two major clinical classes of the disease.

There's type I, which is insulin-dependent diabetes mellitus (IDDM), and type II, which is non-insulin dependent diabetes mellitus (NIDDM). IDDM begins early in life and quickly becomes severe. NIDDM is slow to develop, milder, and often goes unrecognized. IDDM requires insulin therapy and careful, lifelong control of the balance between glucose intake and insulin dose.

Characteristic symptoms of diabetes are excessive thirst (polydipsia) and frequent urination (polyuria), leading to intake of large volumes of water.

Also, excessive hunger and food consumption (polyphagia). These changes are due to excretion of large amounts of glucose in the urine. The term diabetes mellitus means “ excessive excretion of sweet urine.” Suspected genes that cause IDDM are localized on many chromosomes, showing that type I diabetes is a multigene autoimmune response.

Some investigators believe the immune system is confused. They think that the pancreatic beta cells could be recognized as an alien entity because of previous exposure to a foreign substance that had similar proteins to the beta cells. It's believed that T cells target and enzyme glutamate decarboxylase (GAD) present in the beta cells. GAD converts the amino acid glutamate into γ -aminobutyric acid (GABA), a messenger between neurons.

GAD is located in the brain hidden from the immune system. Investigators are hinting that the immune system may not recognize it as a self-protein. GAD resembles the (p69) protein that beta cells show when they are infected by viruses.

GAD plays an important, but it isn't the entire answer. A group of mice disposed to develop diabetes were injected with GAD before the autoimmune response on the pancreas began and all the mice injected with GAD escaped development of diabetes. The affects of IDDM make the patients diseases more burdensome to control.

They usually have vascular and neural problems. Vascular problems that affect IDDM patients are strokes, renal shutdown, gangrene, heart attacks, and blindness that could happen because of the high fat content in the blood and high blood cholesterol levels. Neurological problems that arise from IDDM are loss of sensation, impotence and damaged bladder functions. In women, their breasts are lumpy and experience early menopause. NIDDM occurs mostly after the age of forty. It's a heterogeneous, progressive disorder characterized by pathogenic defects in insulin secretion and action.

Around a quarter to one-third of Americans possess a gene that sways them too the disease. For example, if one identical twin has NIDDM, the chance of the other twin having the disease would be a one hundred percent. In NIDDM, the patient's insulin receptors don't work anymore, but they are still able to produce insulin. Investigators believe a membrane protein is responsible.

They think it's PC-1 because in NIDDM patients, it's levels are higher compared to an average person. Now we may be wondering why NIDDM patients need to diet and exercise, well nearly ninety percent of them are obese. This happens because the adipose cells over produce a hormone like chemical tumor necrosis factor-alpha. What this does is suppress the synthesis of a protein glut4, which enables glucose to go through membranes. If glut4 is not present, the cells can't take up the glucose. In today's market, there are a lot of prescriptions that are available to counter act the deficiency's of IDDM and NIDDM patients. Such drugs are Actos, Starlix, Glucophage, and Avandia, which increase insulin reception for NIDDM, and Glipizide, Glyburide, Tolinase, and Tolbutamide, which increase insulin production for IDDM patients.

For people who have IDDM, they have to inject themselves with insulin four times a day to reduce vascular and renal complications. NIDDM patients will also eventually have to inject themselves. A person can keep track of their glucose levels by using a glucose monitoring machine, which diabetics are not to fond of doing. Poking themselves with a lancet four times a day on their