"Experts in Medicine, Specialists in Care"

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DIABETES

What is Diabetes?

Diabetes is a disease in which your blood sugar levels are too high.

Normally, the sugar you take in is digested and broken down to a simple sugar, known as glucose. The glucose then circulates in your blood where it waits to enter cells to be used as fuel. Insulin, a hormone produced by the pancreas, helps move the glucose into cells. A healthy pancreas adjusts the amount of insulin based on the level of glucose. But, if you have diabetes, this process breaks down, and blood sugar levels become too high.

What are type 1 and type 2 Diabetes?

Diabetes mellitus is divided into two categories:

- **Type I Diabetes**

Also known as **insulin-dependent diabetes**, type I diabetes is an autoimmune destruction of the pancreas that leads to insulin deficiency, which requires daily injections of insulin.

Type 1 diabetes usually occurs in childhood and adolescence, with a peak around age 14.

- **Type 2 diabetes**

Also known as **noninsulin-dependent diabetes**, type 2 diabetes is characterized by a resistance to insulin; hyperglycemia develops despite above-average levels of insulin.

Type 2 diabetes is a disorder of older adults, often presenting in persons in their 40s or 50s. The prevalence of type 2 diabetes increases with increasing age.

What causes diabetes mellitus?

While the mechanisms that cause type 1 and type 2 diabetes differ, they're both characterized by high blood glucose levels and, if left untreated, have similar long-term consequences.

Type 1 diabetes begins with autoimmune destruction of the pancreatic cells. However, an environmental trigger, perhaps a viral infection, is necessary to promote autoimmunity since genetic predisposition alone does not seem to be sufficient.

Type 2 diabetes is characterized by peripheral insulin resistance, impaired regulation of hepatic gluconeogenesis, and a relative impairment of beta-cell function. Insuline resistance, characterized by hyperinsulnemia without frank hyperglycemia, is the earliest detectable abnormality and may precede the diagnosis of diabetes by years. Eventually, beta cells are unable to compensate, and insulin levels are inadequate to maintain euglycemia. In addition, rising glucose levels may further inhibit beta-cell function (glucotoxicity).
The abnormalitites in type 2 DM leading to insulin resistance are the result of genetic predisposition and weight gain. Weight loss, exercise, and decreased caloric intake improve sensitivity to insulin.

Gestational diabetes, which occurs during pregnancy, resembles type 2 diabetes. However, it usually disappears after the baby is delivered. It usually presents in insulin-resistant woman because of hormone changes and weight gain during pregnancy. However, because such a large number of people have undiagnosed diabetes, it is possible that many women already have the illness and are unaware until they are tested during pregnancy.

Who is at risk of developing diabetes?

Several risk factors may increase your risk of developing diabetes. They are:

- ***Obesity*** (the risk starts as soon as you become overweight)
- ***Genetic predisposition*** (However, your genetic predisposition for developing diabetes doesn't make it inevitable that you'll get it. You're less likely to become diabetic if you exercise and maintain a healthy weight).
- ***Having a first-degree relative*** (mother, father, brother, sister or child) with diabetes means you're much more likely to develop the illness yourself.
- Use of some ***medications***
- ***Ethnicity*** (It's not entirely clear why people of color (Native Americans, African Americans, Latinos and Asians) tend to be at a higher risk for developing diabetes even when they are not obese or overweight.

What are the clinical manifestations of diabetes mellitus?

Patients who present with diabetic ketoacidosis appear quite ill and complain of nausea, vomiting, and polyuria.

In contrast, **patients with type 2 diabetes** are often asymptomatic, and the condition is discovered by routine testing. A positive family history of adult-onset diabetes is often present in type 2 diabetics.

Symptomatic patients often present with polyuria, polydipsia, polyphagia, fatigue, and blurred vision. Patients with poor wound healing or recurrent candidal vaginitis should also be tested for diabetes. A minority of patients

initially present with a manifestation of microvascular complications, such as peripheral numbness (neuropathy), loss of vision (retinopathy), angina (coronary artery disease), or claudication (peripheral vascular disease).

What are the consequences of diabetes mellitus?

Hyperglycemia contributes to long-term **microvascular** complications of diabetes: retinopathy, nephropathy, and neuropathy. The incidence of complications increases with worsening glucose control and longer duration of disease.

In addition, patients with diabetes are at increased risk for **macrovascular** complications, including coronary artery disease, peripheral vascular disease, and stroke.

How is diabetes mellitus diagnosed?

To make the diagnosis of diabetes mellitus, one of the following criteria must be present:

- Fasting glucose level > 126 mg/dl (normal < 110 mg/dl)
- Random glucose level > 200 mg/dl with symptoms (polyuria, polydipsia, unexplained weight loss)
- 2-hour glucose level > 200 mg/dl during a 75-g oral glucose tolerance test (OGTT)

To definitely diagnose DM, one of these criteria must be confirmed on a subsequent day. Milder forms of glucose intolerance include impaired fasting glucose and impaired glucose tolerance. These two classifications identify a group of individuals at increased risk for diabetes.

Once the diagnosis of DM is confirmed, glucose control may be assessed by self-monitoring of glucose.

How is diabetes mellitus treated?

Your doctor may prescribe you:

- changes in eating habits
- weight control
- exercise programs
- and even drugs to keep it in check.

It's critical for people with diabetes to have regular checkups. Work closely with your healthcare provider to manage diabetes and control any other risk factors.

Diabetic management is twofold: restore glycemic control and monitor for and treat of complications of long-term diabetes.

Dietary therapy:

In type 2 DM, dietary treatment combined with exercise and weight loss may be sufficient to achieve adequate glucose control. Close attention to dietary intake is also important to type 1 DM to avoid wide fluctuations in blood sugar and limit the total amount of insulin required.

A balanced diet of 55% carbohydrates, 15% protein, and 30% fat is recommended. For patients with type 2 diabetes, caloric restriction (1500 to 2000 kcal/day) is also important to achieve weight loss when appropriate.

Consultation with a dietician is highly recommended to enhance patient understanding and compliance.

What are the types of diabetes?

There are two main types of full-blown diabetes. People with Type 1 diabetes are completely unable to produce insulin. People with Type 2 diabetes can produce insulin, but their cells don't respond to it. In either case, the glucose can't move into the cells and blood glucose levels can become high. Over time, these high glucose levels can cause serious complications.

What are the consequences of diabetes?

How are insulin resistance, diabetes and CVD related?

Diabetes is treatable, but even when glucose levels are under control, it greatly increases the risk of heart disease and stroke. In fact, most people with diabetes die of some form of heart or blood vessel disease.

Pre-diabetes and subsequent type 2 diabetes usually result from insulin resistance. When insulin resistance or diabetes occur with other CVD risk factors (such as obesity, high blood pressure, abnormal cholesterol and high triglycerides), the risk of heart disease and stroke rises even more.

Insulin resistance is associated with atherosclerosis (fatty buildups in arteries) and blood vessel disease, even before diabetes is diagnosed. That's why it's important to prevent and control insulin resistance and diabetes. Obesity and physical inactivity are important risk factors for insulin resistance, diabetes and cardiovascular disease.

How do I live with diabetes?

With good self-management, you can enjoy a healthy life and minimize your chances of developing complications.

Here are some essential steps for keeping healthy:

First of all, it is important to learn as much as you can about diabetes, and educate others close to you.

- Eat a healthy, varied diet, sticking to foods that are low in saturated fat and cholesterol, and limit "concentrated" sweets like candy.

- Regularly monitor your blood sugar levels (see "Monitoring your blood sugar levels").
- Have a glycosylated hemoglobin test every three to six months, or more often if you're pregnant.
- Exercise regularly and maintain a normal weight.
- Schedule regular visits with your doctor. Have your blood pressure and feet checked at all visits. Your doctor should test your blood lipids and kidney function regularly and do an annual EKG.

- Have an annual eye exam by an ophthalmologist. This should be done from the time of diagnosis in people with type 2 diabetes, and starting five years after diagnosis in people with type 1 diabetes.
- To avoid illness, stay up-to-date on your immunizations. Talk to your doctor about getting vaccinated against the flu, pneumococcal disease (such as pneumonia and meningitis), hepatitis, tetanus, and diphtheria.
- Practice good foot and skin care
- Visit a dentist regularly
- Avoid risky behaviors, such as smoking or drug or alcohol abuse.

Both forms of diabetes may be inherited in genes. A family history of diabetes can significantly increase the risk of developing diabetes. Untreated diabetes can lead to many serious medical problems. These include blindness, kidney disease, nerve disease, limb amputations and cardiovascular disease (CVD).

Diabetes remains a serious cause of mortality and morbidity.