



Review of diabetes types and Care

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Abstract

Diabetes is a condition that impairs the body's ability to process blood glucose, otherwise known as blood sugar. In the United States, the estimated number of people over 18 years of age with diagnosed and undiagnosed diabetes is 30.2 million. The figure represents between 27.9 and 32.7 percent of the population. Without ongoing, careful management, diabetes can lead to a buildup of sugars in the blood, which can increase the risk of dangerous complications, including stroke and heart disease. Different kinds of diabetes can occur, and managing the condition depends on the type. Not all forms of diabetes stem from a person being overweight or leading an inactive lifestyle. In fact, some are present from childhood.

Keywords: Types, How insulin problems develop, Exercise and diet tips

Introduction

Three major diabetes types can develop: Type 1, type 2, and gestational diabetes:

Type I diabetes: Also known as juvenile diabetes, this type occurs when the body fails to produce insulin. People with type I diabetes are insulin-dependent, which means they must take artificial insulin daily to stay alive.

Type 2 diabetes: Type 2 diabetes affects the way the body uses insulin. While the body still makes insulin, unlike in type I, the cells in the body do not respond to it as effectively as they once did. This is the most common type of diabetes, according to the National Institute of Diabetes and Digestive and Kidney Diseases, and it has strong links with obesity.

Gestational diabetes: This type occurs in women during pregnancy when the body can become less sensitive to insulin. Gestational diabetes does not occur in all women and usually resolves after giving birth.

Less common types of diabetes include monogenic diabetes and cystic fibrosis-related diabetes.

Prediabetes:- Doctors refer to some people as having prediabetes or borderline diabetes when blood sugar is usually in the range of 100 to 125 milligrams per deciliter (mg/dL).

Normal blood sugar levels sit between 70 and 99 mg/dL, whereas a person with diabetes will have a fasting blood sugar higher than 126 mg/dL.

The prediabetes level means that blood glucose is higher than usual but not so high as to constitute diabetes.

People with prediabetes are, however, at risk of developing type 2 diabetes, although they do not usually experience the symptoms of full diabetes. The risk factors for prediabetes and type 2 diabetes are similar. They include:

- being overweight
- a family history of diabetes
- having a high-density lipoprotein (HDL) cholesterol level lower than 40 mg/dL or 50 mg/dL
- a history of high blood pressure
- having gestational diabetes or giving birth to a child with a birth weight of more than 9 pounds
- a history of polycystic ovary syndrome (PCOS)
- being of African-American, Native American, Latin American, or Asian-Pacific Islander descent
- being more than 45 years of age
- having a sedentary lifestyle

If a doctor identifies that a person has prediabetes, they will recommend that the individual makes healthful changes that can ideally stop the progression to type 2 diabetes. Losing weight and

having a more healthful diet can often help prevent the disease. How insulin problems develop:- Doctors do not know the exact causes of type I diabetes. Type 2 diabetes, also known as insulin resistance, has clearer causes.

Insulin allows the glucose from a person's food to access the cells in their body to supply energy. Insulin resistance is usually a result of the following cycle:

- A person has genes or an environment that make it more likely that they are unable to make enough insulin to cover how much glucose they eat.
- The body tries to make extra insulin to process the excess blood glucose.
- The pancreas cannot keep up with the increased demands, and the excess blood sugar starts to circulate in the blood, causing damage.
- Over time, insulin becomes less effective at introducing glucose to cells, and blood sugar levels continue to rise.

In the case of type 2 diabetes, insulin resistance takes place gradually. This is why doctors often recommend making lifestyle changes in an attempt to slow or reverse this cycle.

Exercise and diet tips:- If a doctor diagnoses a person with type 2 diabetes, they will often recommend making lifestyle changes to support weight loss and overall health.

A doctor may refer a person with diabetes or prediabetes to a nutritionist. A specialist can help a person with diabetes lead an active, balanced lifestyle and manage the condition. Steps a person can take to embrace a lifestyle with diabetes include:

- Eating a diet high in fresh, nutritious foods, including whole grains, fruits, vegetables, lean proteins, low-fat dairy, and healthy fat sources, such as nuts.
- Avoiding high-sugar foods that provide empty calories, or calories that do not have other nutritional benefits, such as sweetened sodas, fried foods, and high-sugar desserts.

- Refraining from drinking excessive amounts of alcohol or keeping intake to less than one drink a day for women or two drinks a day for men.
- Engaging in at least 30 minutes exercise a day on at least 5 days of the week, such as walking, aerobics, riding a bike, or swimming.
- Recognizing signs of low blood sugar when exercising, including dizziness, confusion, weakness, and profuse sweating.

People can also take steps to reduce their body mass index (BMI), which can help some people with type 2 diabetes manage the condition without medication.

Slow, steady weight loss goals are more likely to help a person retain long-term benefits.

Using insulin:- People with type I diabetes and some people with type 2 diabetes may need to inject or inhale insulin to keep their blood sugar levels from becoming too high.

Various types of insulin are available, and most are grouped by how long their effect lasts. There are rapid, regular, intermediate, and long-acting insulins.

Some people will use a long-acting insulin injection to maintain consistently low blood sugar levels. Some people may use short-acting insulin or a combination of insulin types. Whatever the type, a person will usually check their blood glucose levels using a fingerstick.

This method of checking blood sugar levels involves using a special, portable machine called a glucometer. A person with type I diabetes will then use the reading of their blood sugar level to determine how much insulin they need.

Self-monitoring is the only way a person can find out their blood sugar levels. Assuming the level from any physical symptoms that occur may be dangerous unless a person suspects extremely low glucose and thinks they need a rapid dose of glucose.

How much is too much?

Insulin helps people with diabetes live an active lifestyle. However, it can lead to serious side effects, especially if a person administers too much.

Excessive insulin can cause hypoglycemia, or extremely low blood sugar, and lead to nausea, sweating, and shaking.

It is essential that people measure insulin carefully and eat a consistent diet that balances blood sugar levels as much as possible.

Self-monitoring tips

Self-monitoring blood sugar levels is vital for effective diabetes management, helping to regulate meal scheduling, physical activity, and when to take medication, including insulin.

While self-monitoring blood glucose (SMBG) machines vary, they will generally include a meter and test strip for generating readings and a lancing device to prick the skin for obtaining a small quantity of blood.

Refer to the specific instructions of a meter in every case, as machines will differ. However, the following precautions and steps will apply to many of the machines on the market:

- Make sure both hands are clean and dry before touching the test strips or meter
- Do not use a test strip more than once and keep them in their original canister to avoid any external moisture changing the result.
- Keep canisters closed after testing.
- Always check the expiration date.
- Older meters might require coding prior to use. Check to see if the machine currently in use needs this.
- Store the meter and strips in a dry, cool area.
- Take the meter and strips into consultations, so that a primary care physician or specialist can check their effectiveness.

A person who is self-monitoring diabetes uses a device called a lancet to prick the skin. While the idea of drawing blood might cause distress for some people, the lancing of the finger to obtain a blood sample should be a gentle, simple procedure.

Take the following precautions:

- Clean the area from which the sample will come with soapy, warm water to avoid food residue entering the device and distorting the reading.
 - Choose a small, thin lancet for maximum comfort.
 - The lancet should have depth settings that control the depth of the prick. Adjust this for comfort.
 - Many meters require only a teardrop-sized sample of blood.
 - Take blood from the side of the finger, as this causes less pain. Using the middle finger, ring finger, and little finger may be more comfortable
 - While some meters allow samples from other test sites, such as the thighs and upper arms, the fingertips or outer palms produce more accurate results.
 - Tease blood to the surface in a "milking" motion rather than placing pressure at the lancing site.
 - Dispose of lances in line with local regulations for getting rid of sharp objects.
- While remembering to self-monitor involves lifestyle adjustments, it need not be an uncomfortable process.

Outlook

Diabetes is a serious, chronic condition. According to the American Diabetes Association (ADA), the condition is the seventh leading cause of death in the U.S.

While diabetes itself is manageable, its complications can severely impact on daily living, and some can be fatal if not treated immediately.

Complications of diabetes include:

- dental and gum diseases
- eye problems and sight loss

- foot problems, including numbness, leading to ulcers and untreated injuries and cuts
- heart disease
- nerve damage, such as diabetic neuropathy
- stroke
- kidney disease

In the case of kidney disease, this complication can lead to kidney failure, water retention when the body does not dispose of water correctly, and a person experiencing difficulties with bladder control.

Regularly monitoring blood glucose levels and moderating glucose intake can help people prevent the more damaging complications of type 2 diabetes.

For those with types 1 diabetes, taking insulin is the only way to moderate and control the effects of the condition.

Takeaway:-

Diabetes is a life-changing condition that requires careful blood sugar management and a healthy lifestyle for a person to be able to manage it correctly. There are several different types of the disease.

Type I occurs when the body does not produce insulin. Type 2 happens when excess consumption of high-sugar foods flood the blood supply with glucose and reduce the production and effectiveness of insulin.

People can take supplementary insulin to manage the condition and improve glucose absorption. If a person has prediabetes, they can reduce the risk of full diabetes through regular exercise and a balanced, low-sugar diet.

The complications of diabetes can be severe, including kidney failure and stroke, so managing the condition is vital.

Anyone who suspects they may have diabetes should visit their doctor.

Q:

If prediabetes causes no symptoms, how do I know I have it and take steps to reverse the condition?

A:

In general people who are at risk for diabetes often get screened at their doctor's office. The risk factors are listed above, and different groups have slightly different recommendations about when and how often to screen.

Most of the time, we use a test called a hemoglobin A1C that tells us how you have controlled your sugars over the previous 3 months. This test can also tell your doctor how likely it is that you will develop diabetes in the near future — the higher the level, then the more likely this is.

The main steps to reverse prediabetes are the same things we talk about above — losing weight if you are overweight, getting regular exercise, and eating a balanced diet.

Suzanne Falck, MD, FACP Answers represent the opinions of our medical experts. All content is strictly informational and should not be considered medical advice.

References

- [1] - Association of glycaemia with macrovascular and microvascular complications of Type 2 diabetes: prospective observational study. *British Medical Journal* 2000; 321: 405-412.
- [2] - *Nature Genetics Journal* - April 7, 2010.
- [3] - *The price of innovation: new estimates of drug development costs* - DiMasi J, Hansen R, Grabowski H, 2003.
- [4] - *Prescribing for Diabetes England 2005-06 to 2013-14* - Health and Social Care Information Centre, 2014.
- [5] - *Diabetes in the UK 2010: Key statistics on diabetes* - published March 2010.
- [6] - *Eating while sitting at a computer screen can affect your appetite* - published December 2010.
- [7] - *Dietary carbohydrate restriction in type 2 diabetes mellitus and metabolic syndrome: time for a critical appraisal* - Richard K Bernstein, 2008
- [8] - *Low carbohydrate diets for diabetes control* - Dr Katharine Morrison, 2005
- [9] - *Low-carbohydrate diet in type 2 diabetes: stable improvement of bodyweight and glycemic control during 44 months follow-up* - Nielsen JV, Joensson EA, 2008
- [10] - *UK fat alert: 26 million will be obese by 2030* - Jeremy Laurance, published August 26, 2011
- [11] - *Diabetes UK and South Asian Health Foundation recommendations on diabetes research priorities for British South Asians* - Diabetes UK, published June 2009
- [12] - *ACCORD study: Effects of Intensive Glucose Lowering in Type 2 Diabetes* - The Action to Control Cardiovascular Risk in Diabetes Study Group, June 2008
- [13] - *ADVANCE study: Intensive Blood Glucose Control and Vascular Outcomes in Patients with Type 2 Diabetes* - The ADVANCE Collaborative Group, published June 2008
- [14] - *Healthy lives, healthy people: a call to action on obesity (2011)* - published October 2011
- [15] - *Foresight Report 'Tackling Obesities: Future Choices' (2007)* - published 2007
- [16] - *Diabetes Facts and Stats: 2015* - Diabetes UK, published 2015
- [17] - *Preventing the Type 2 diabetes epidemic: October 2009* - Diabetes UK, published 2009
- [18] - *Medical rules for drivers* - Direct.gov - retrieved November 30, 2011
- [19] - *Guidance for Management of Postmeal Glucose* - International Diabetes Federation, 2007.

- [20] - *Effects of Coffee Consumption on Fasting Blood Glucose and Insulin Concentrations* - Rob M. van Dam, PHD, Wilrike J. Pasman, PHD and Petra Verhoef, 2011.
- [21] - *Coffee and tea consumption and risk of type 2 diabetes* - Julius Centre for Health Sciences and Primary Care, 2009.
- [22] - *Tea enhances insulin activity* - Anderson RA, Polansky MM, 2002.
- [23] - *Lilly Diabetes - Insulin injections* - LillyDiabetes.com, retrieved March 19, 2012.
- [24] - *Diabetes UK - Sites* - Diabetes UK, retrieved March 19, 2012.
- [25] - *BD Diabetes: Rotation* - Becton, Dickinson U.K, retrieved March 19, 2012.
- [26] - *NHS - 5 a Day* - NHS, retrieved March 23, 2012
- [27] - *Red Meat Consumption and Mortality* - Arch Intern Med. Published online March 12, 2012. doi:10.1001/archinternmed.2011.2287
- [28] - *Association between stress and glycemic control in adults with type 1 (insulin-dependent) diabetes* - Lloyd CE, Dyer PH, Lancashire RJ, Harris T, Daniels JE, Barnett AH. Diabetes Care 22: 1278 –1283, 1999.
- [29] - *Exercise and insulin sensitivity: a review* - Borghouts LB, Keizer HA, Department of Movement Sciences, Maastricht University, The Netherlands - 2000.
- [30] - *Improving diabetes self-management through acceptance, mindfulness, and values: a randomized controlled trial*- Gregg JA, Callaghan GM, Hayes SC, Glenn-Lawson JL. J Consult Clin Psychol 2007, 75:336-343.
- [31] - *Depression in diabetic patients: the relationship between mood and glycemic control* - Lustman PJ, Clouse RE. J Diabetes Complications 2005, 19:113-122.
- [32] - *Diabetes, depression, and death: a randomized controlled trial of a depression treatment program for older adults based in primary care (PROSPECT)*- Bogner HR, Morales KH, Post EP, Bruce ML Diabetes Care 2007, 30:3005-3010.
- [33] - *Diabetes and anxiety in US adults: findings from the 2006 Behavioral Risk Factor Surveillance System* - Li C, Barker L, Ford ES, Zhang X, Strine TW, Mokdad AH. Diabet. Med. 25(7), 878–881 (2008).
- [34] - *Effects of mindfulness-based stress reduction (MBSR) on emotion regulation in social anxiety disorder* - Goldin, P.R., Gross, J.J. (2010). Emotion; 10(1): 83-91
- [35] - *Mindfulness and the treatment of anger problems* - Wright, S., Day, A., & Howells, K. (2009). Aggression and Violent Behaviour, 14(5), 396–401.
- [36] - *Mindfulness-based stress reduction and health benefits* - Grossman P, Niemann L, Schmidt S, Walach H. A meta-analysis. J Psychosom Res 2004, 57:35-43.
- [37] - *Mindfulness-based stress reduction is associated with improved glycemic control in type 2 diabetes mellitus: a pilot study* - Rosenzweig S, Reibel DK, Greeson JM, Edman JS, Jasser SA, McMearty KD, Goldstein BJ. Altern Ther Health Med 2007, 13:36-38.
- [38] - *Impact of meditation on resting and ambulatory blood pressure and heart rate in youth* - Barnes VA, Davis HC, Murzynowski JB, Treiber FA. Psychosom Med 2004, 66:909-914.

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