

Diabetes and nutrition

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Introduction

Diabetes mellitus is a continual disorder of carbohydrate and lipid metabolism in which blood levels of glucose and lipids are elevated. This abnormal metabolism results from a relative lack of insulin, either too little insulin is secreted or the insulin that is secreted is not effective. In addition, diabetes is associated with chronic systemic complications, which, over time, can affect the retina, kidneys, nerves, and cardiovascular system. The most common classifications of diabetes mellitus include type I, or insulin-dependent, diabetes mellitus (IDDM); type II, non-insulin-dependent diabetes mellitus (NIDDM); and gestational diabetes (GD).

How it is Developed

The problems of diabetes originate in an organ located behind the stomach about the length of a human hand called the pancreas. The pancreas is necessary for both digesting food and regulating energy. It is the regulation of energy for the body that is important in the development of diabetes. The pancreas produces hormones that metabolize food. These hormones regulate the use of glucose, a simple sugar, which is used for most of the activities in our bodies. The pancreas regulates energy in a variety of behaviors in which humans engage such as exercise and movement, responding to trauma and stress, and infections.

The pancreas emits three different types of hormones. Insulin is the first hormone that is produced when glucose rises in the blood. Insulin usually rises after eating a meal, and excess glucose that is not used is stimulated by insulin to be stored in muscles and fat cells so that energy can be used

later. The liver also stores excess glucose in the form of a carbohydrate called glycogen. The second type of pancreatic hormone is glucagon. Glucagon breaks down glycogen stored in the liver so that it can be used as energy when blood glucose supplies are down. The third type of pancreatic hormone is called somatostatin, thought to be important in regulating both insulin and glucagon.

When diabetes develops, this balanced control system does not operate properly. The glucose in the bloodstream increases, and the cells are not able to utilize it. The individual develops hyperglycemia (excess glucose in the blood). This can be detected by measuring the glucose in the blood from a blood sample, or if the glucose is elevated enough, it can be detected in the urine as spillover. This sort of situation occurs when there is not enough insulin to permit the cells to utilize the glucose, or there is resistance most likely at the cellular level to the presence of insulin. Both cases produce diabetes.

Symptoms of Diabetes

Some of the symptoms of Diabetes Mellitus are increased thirst, increased urination, weight loss even though the individual is eating more, fatigue, nausea, and vomiting, skin infections, vaginitis, blurred vision, bladder infections, and impotence in men and cessation of menses in women.

One severe symptom of diabetes is diabetic ketoacidosis. This symptom sometimes produces slightly sweet-smelling breath that is caused by acetone, a metabolic byproduct, when the body is forced to burn fatty acids rather than glucose. This process becomes more and more toxic to the body

as it continues; the individual may develop diabetic coma and die. Ketoacidosis occurs when individuals are either not getting enough insulin or the insulin is not adequate to allow cells of the body to utilize the glucose.

Effects of Diabetes

Diabetes has two types of long-term effects. One type is associated with blood vessel involvement. Damage to the large vessels puts the diabetic at greater risk of stroke, heart attack, and gangrene of the feet. When small blood vessels are damaged, eyes, kidneys, and nerves become damaged. The other long-term effect is nerve damage usually in the feet, but also occasionally in the hands. This nerve damage is called diabetic neuropathy. This damage may cause a painful burning sensation with loss of sensation over time, making the body part more subject to injury and infection. Foot ulcers and gangrene can develop, with further damage in the extremities. In men, diabetic neuropathy may cause erectile impotence.

Nutrition for Diabetes

Consultation with a dietitian familiar with children and with type 2 diabetes is important for all patients. The dietitian should assess the nutritional status and practices of the patient and then counsel them to provide a meal plan which, at least initially, does not deviate in a major way from their usual eating practices. Changes made gradually, through subsequent appointments and interviews, frequently achieve compliance more successfully than does radical and rapid change.

Individuals providing counseling must be clear about the differences in the management of patients with type 1 and type 2 diabetes. Because obesity is a

typical finding in type 2 diabetes and caloric restriction results in improved glycemic control and insulin sensitivity, modest caloric restriction and weight loss or maintenance are important goals: so is correction of the dyslipidemia, which frequently accompanies the metabolic syndrome or IRS.

In general, calories from dietary fat should not exceed 30% of energy intake, and calories from saturated fat should not exceed 10%. An effort is also made to limit cholesterol in the diet to <300 mg/day, and <200 mg/day if hypercholesterolemia is present. Monounsaturated fats can be increased to up to 15-20% of total calories and may have beneficial effects on triglycerides and high-density lipoprotein (HDL). Protein should account for 15-20% of total calories. The remainder of calories is made up of carbohydrate.

Dietary advice for people with diabetes has changed over recent years. Old regimen instructions demanded that all foodstuffs were weighed and their energy content calculated according to standard tables. Everything was assigned a specific value, and patients were expected physically to weigh each constituent of every meal. This fashion of numerical quantification has now been relaxed with the realization that it is impossible to quantify every factor in what is now conceived of as a lifestyle disease, and that, far from assisting patients, the strategy was itself a major cause of distress that impeded compliance. The focus now is on education, integrating medical advice within the patient's existing lifestyle rather than attempting to supplant it.

What health professionals denote is that since the objective is to 'live a normal life' patients should not become over-obsessed and not be excluded

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from special occasion foods such as at weddings and birthdays. A treat for patients, however, is often the regular, habitual tonic that they use as a focus in their day-to-day lives. It is tempting to think that for diabetics it is because certain foods should be eliminated that they are desired. However, many state that sweet foods, such as confectioneries and cakes, were regarded as personal rewards even prior to diagnosis.

These special foods are defined not solely by their sweetness, but in combination with their place in people's diets as extras: not satisfying hunger so much as providing sensual pleasure at certain times in daily routines. This reward dimension is fully incorporated into the rhythms of their lives, supplying markers between periods of labor, such as mid-morning breaks or afternoon snacks. That it is precisely these which are banned is interpreted as belief-affirming; treats always were seen as transgressions from labor, and the medical advice derived from the diabetes merely confirms their status. When pressed, patients admit that they are aware the advice does not really condone regular misdeeds. Yet, leaving the message sufficiently unquestioned serves to absolve them morally.

In the early years after the discovery of the disease, there was carbohydrate restriction, then an increase in carbohydrates and reduction in fat intake. Now the American Diabetes Association recommends 10% to 20% protein in the diet but no specific limitations on carbohydrates and fats. An individualized dietary plan is recommended, including occasional indulgences in small amounts of sucrose. The effects of drugs on blood sugar must be given serious consideration in the management of diabetes because

a number of medications commonly used for elders affect blood sugar in adverse ways.

The probability of developing diabetes increases if someone eats many foods that have a high glycemic index score—foods that quickly increase blood sugar levels, for example soda, ice cream, and chocolate cake. Thus it shouldn't be surprising that eating in the opposite way, that is, eating foods that don't quickly increase blood sugar levels—high-fiber foods such as beans, whole-wheat bread, and oranges—may help normalize blood sugar levels and control diabetes. Recent findings indicate that people who eat lots of fiber are less likely to have gained weight or to have abnormal insulin levels a decade later. So eating lots of fiber may help to prevent or control diabetes. People who perceive themselves as generally able to accomplish their goals are relatively successful at controlling what they eat so as to live reasonably well with diabetes.

Conclusion

The majority of patients fail to keep within the desired range of blood sugar levels, and although medication can easily be altered, it is the diet that is the first thing to come under scrutiny. In this way, food, the means of success rapidly comes to serve also as a means of symbolizing guilt and failure. Its dual function is useful in this way to both professional and patient, since it provides a common site on which both can focus, distilling the vast range of possible lifestyle factors into clear elements that can be acted upon.

Reference

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Hiser, Elizabeth N. (2002). *The Other Diabetes: Living and Eating Well*. New York: William Morrow.