

Diet in Diabetes

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Diabetes a metabolic disorder is characterized by high blood sugar. From where does this extra sugar come? Sugar (glucose) the main source of fuel for the body comes from the food we eat and is also made in liver and muscles. Blood carries the glucose to all the cells in your body. Insulin a hormone produced by pancreas is the key that unlocks cells and lets the glucose enter, thus providing energy for cell functions. In people with diabetes, however the pancreas either produces little or no insulin or the cell does not respond appropriately to the insulin (insulin resistance). Without effective insulin utilization of glucose is impaired as a result glucose builds up in the blood. High blood glucose can lead to both the short term and long term complications

Acute complications include hypoglycemia (low blood glucose) ketoacidosis and infections. These results due to sudden or severe decrease or increase in blood sugar levels. Poorly managed diabetes can lead to a host of long term complications like high blood pressure, heart diseases, lesions to small blood vessels, loss of vision, kidney failure and neurological problems.

There are different kinds of diabetes, each with slightly varying symptoms and treatments. The principal forms are Type 1, Type 2 and Gestational diabetes.

In type 1 (also called juvenile-onset or insulin-dependent) diabetes, the body completely stops producing any insulin. People with type 1 diabetes must take daily insulin injections to survive. This form of diabetes usually develops in children or young adults, but can occur at any age.

Type 2 (also called adult-onset or non insulin-dependent) diabetes results when the body doesn't produce enough insulin and/or is unable to use insulin properly (insulin resistance). This form of diabetes usually occurs in people who are over 40, overweight, and have a family history of diabetes, although it is increasingly occurring at young age.

Gestational diabetes is a form of diabetes that develops during pregnancy. High blood glucose levels can be dangerous to the baby and may lead to a number of possible complications with the pregnancy. So, it is vitally important for the health of the baby - and for the mother - that the blood glucose level should remain as near normal as possible.

MANAGEMENT OF DIABETES

Objectives are to achieve normal or near normal blood sugars and lipid levels, to provide optimum nutrition with a healthy balanced diet and to avoid acute complication, to prevent or

delay or arrest long term complications To enable them to lead a normal well-adjusted life. The objectives can be achieved with regular self-monitoring and proper combination of diet, exercise and medications.

DIET IN DIABETES

Diabetic diet is not about avoiding sugar, sweets, rice, banana, potato etc. Principle of diabetic diet is to match the nutritional requirements with balanced diet (A balanced diet contains the optimum amounts of nutrients in order to promote health). The nutritional requirements of diabetics are the same as in non-diabetics. The nutrient intake has to be tailor made to the individual based on the age, sex, weight, height, physical activity and physiological needs of the patient.

Goal of diet therapy in person with type 1 diabetes is to provide adequate energy to ensure normal growth and development, integrate insulin regimens into usual eating and physical activity habits.

For person with type 2 diabetes, goal depends largely on individual situation. Main focus is on weight control, because 80-90% of people with this disease are overweight or obese. The right combination of diet, exercise and adequate medication when needed is the key to effective management of Type 2 diabetes.

For pregnant and lactating women, to provide adequate energy and nutrients needed for optimal outcomes.

The food that we eat is utilized for energy and various processes. The potential of food to provide energy is measured by number of calories it provides. Food is made up of three main components – carbohydrates, fats and proteins. In addition to these, we also need vitamins and minerals. For good energy and optimum nutrition it is essential to have all these food groups in the diet.

Calorie

Calories are the basic unit of energy within food. The number of calories in a food is a measure of how much potential energy that food possesses. A gram of carbohydrates has 4 calories, a gram of protein has 4 calories, and a gram of fat has 9 calories. When we eat our body converts food into energy and utilizes it and stores what it does not require in the form of fat.

A calorie is a calorie whether it comes from chapatti, rice, dal, vegetable, fruit or junk food. The difference between them is number of calories, percentage of macronutrient, vitamins, and minerals in it.

How much calories should a diabetic consume? The caloric requirements of diabetics are the same as in non-diabetics. The intake has to be tailor made to the individual based on the age, sex, weight, height, physical activity and physiological needs of the patient.

A diabetic should consume the amount of calories with regard to their nutritional requirements. For person with type 1 diabetes, adequate energy should be provided to ensure normal growth and development.

Given the tight relationship between obesity and type 2 diabetes, the main objective is restriction of calories and even distribution of calories. The meal plan is not just restriction of calories; it is intended to ensure a reasonably consistent food intake and a nutritionally balanced diet.

Adequate calories are also needed to meet the increased metabolic requirements of pregnancy and lactation.

In type 1 and gestational diabetics weight and growth patterns and in type 2 monitoring body weight are to practical way to assess adequacy of the diet.

Carbohydrates

A major component of Indian diet. It is a common belief that to achieve a good glycaemic control or to reduce weight one should restrict carbohydrates. This is not true for carbohydrates only, but for all macronutrient when consumed more than required.

Carbohydrates are energy yielding compounds. But are also essential as structural element and many necessary compounds of the body are derived from carbohydrates.

Carbohydrates come in two types- simple and complex.

Simple carbohydrates are made up of one or two sugar molecules. They are called simple because body digests them quickly and easily. The natural simple carbohydrate is present in fruits, some type of rice, milk and milk products and honey. Refined sugar, jaggery and maida and maida products are examples of synthetic simple sugars.

Complex carbohydrates are made up of sugar molecules that are strung together in long, complex chains. These are found in whole grains, pulses, beans, fruits and vegetables. Both simple and complex carbohydrate are turned to glucose in the body, then which is preferred and why. Body digests simple carbohydrates quickly and easily and causes an acute rise in blood sugars, which if not utilized can increase the harmful glycated products and lipid levels. Good physical activity followed by intake of simple carbohydrates is a good way to ensure its utilization. On other hand complex are digested slowly, as a result they release sugar in sustained manner in blood. Refined sugar and flour (maida) are often called empty calories because they lack vitamins, minerals and fibre. Should be avoided or consumed in restricted amounts as they have little or no nutritional value and should consume complex and naturally occurring simple ones.

Quantity of carbohydrates is equally important. Excess complex carbohydrates can lead to weight gain, high blood sugars and lipids. Day to day consistency in the amount of carbohydrate is important. To make sure your food servings are the right size, use: measuring cups, measuring spoons or a food scale.

Cereals (whole grains) are good source of complex carbohydrate except some variety of rice. All cereals more or less contains same amount of calories, carbohydrate, protein and fats and hence can be substituted. It is very important that an equal amount of one cereal is substituted for another. E.g. one chapatti is not equal to bhakri; instead one bhakri is equal to three or four chapattis.

Rice is naturally occurring simple carbohydrate, therefore advised to consume in restricted amount or should be eaten if physical activity is followed after the course. Hence advised in lunch than in dinner. Preroasting rice before cooking, adding vegetables are some methods to decrease the fast digestion of rice. Brown rice and basmati rice are preferred over polished rice because it contains more amounts of complex carbohydrates.

Protein

Protein to cells is similar; as bricks to the wall. Protein's biggest job is to build up, keep up, and replace the tissues in the body and is essential component of various substances in the body. If needed can be diverted for energy processes. It even makes antibodies, the cells that fight off infection and disease.

Protein is really a combination of many chemicals called amino acids. There are 20 different amino acids in protein, and these 20 amino acids can combine in lots of ways - in fact, they have joined together to make thousands of different proteins. Body can synthesize 11 amino acids and so these amino acids are called nonessential amino acids and the rest nine are called essential amino acids, as the body cannot synthesize them. No matter how hard the body tries it won't ever make essential amino acids. That's where eating foods with protein comes in, to give body the amino acids it needs. Adequate protein intake is necessary because about every cell in our body has a protein component, and we are unable to synthesize new cells without the requisite building blocks.

Proteins are classified as vegetable protein (cereal, pulse and vegetable) and nonvegetable protein (milk, whole egg and egg white, fish, shell fish, chicken and mutton). The amino acid profile of nonvegetable protein scores over vegetable protein, but they are rich in saturated fat. A diet high in nonvegetable protein could lead to high cholesterol and cardiovascular disease. Another potential problem is that a high-protein diet may put a strain on the kidneys. On other hand vegetable protein source are rich in fibre (insoluble and soluble), vitamins, minerals, antioxidants and are very low in fat. Therefore it recommended, to consume both vegetable and nonvegetable protein. Vegetarians are able to get enough protein if they eat the proper combination of plant proteins.

Healthy Ways to Eat Non-vegetable protein is Skim milk, toned milk or low fat milk products. Prefer egg whites to whole egg, fish to chicken and mutton, chicken breast to chicken leg. Trim off extra fat. Eat chicken or turkey without the skin. Cook meat or meat substitutes in low-fat ways: broil, grill, stir-fry, roast, steam, stew. Avoid coconut-based gravies. To add more flavors, add onion, tomato, garlic and ginger. Use vinegars, lemon juice, soy sauce, ketchup, barbecue sauce, and herbs and spices. People with diabetes have no less or more need for protein than the general public (unless indicated for some complication). To ensure good intake of protein make sure there is one protein food in your

plate-good amount of dal or whole pulses / egg white curry/ fish/ chicken. In diabetic with renal or liver disease processing of protein is impaired hence some restriction is required.

Fats

It is a common myth that fat is a bad thing that people should not eat, but actually our bodies need some fat to work correctly. Fat insulates our bodies from the cold and provides some cushioning for our organs. Fat gives our bodies energy. Some fats help to make up important hormones that we need to keep our bodies at the right temperature or keep our blood pressure at the right level. And fat is like body's very own storage and moving service: and are mobilized when body needs them!

Quantity of the fat is important. Even though our bodies need some fat to work properly, they don't need as much as most people eat. Fats are of two types visible fat (ghee, oil, butter, etc.) and invisible fat (coconut, nuts, oilseeds, milk cream, egg yolk, fat present in non-vegetarian foods).

It's a good idea to avoid eating a lot of fat, because it can contribute to obesity, worsen the diabetic status and accelerate the appearance of the complications. Dietary fat intake can be reduced by lowering the amount of visible and invisible fat intake and by opting low fat snacks fat or fat-free versions of food like sprout bhel, roasted snacks, roasted chanas, kurmuras, and khakras. Best thing to eat between the meals is one fruit, salads or to have a bowl of soup.

It is generally difficult to avoid fried stuff or fat rich food as they are more accepted by the taste buds. In such case moderation is the key. Indulging once in a while is ok but not very often especially during festive season or while socializing. Not to eat these kinds of foods all the time, or even most of the time. Instead, eating only a little bit at a time and not very often. Limiting these foods will help you lose weight and keep your blood glucose and blood fats under control.

Cholesterol

Foods high in cholesterol include dairy products, egg yolks, meats, organ meats and shellfish. Blood cholesterol is not only determined by how much cholesterol rich food one eats but is also influenced by total caloric intake, total fat intake particularly saturated fat, amount of dietary fibre (especially soluble fibre), body weight, type of lifestyle and genetics.

However, it is important that one is aware of sources of dietary cholesterol. Modifying the factor responsible for high cholesterol is the key for reduction.

Fibre

Fibre is made up of the indigestible parts or compounds of plants that pass relatively unchanged through our stomach and intestines. It is largely a carbohydrate but as they human gut cannot process it they don't supply calories. So if fiber does not give us any calories, why exactly should you eat it?

There are two types of fiber: water insoluble and water-soluble. Soluble fibre - includes pectins, gums and mucilage, which are found mainly in plant cells. One of its major roles is to lower blood sugars and cholesterol levels. Good sources of soluble fibre include fruits, vegetables, oatbran, barley, seed husks, flaxseed,

psyllium, dried beans, lentils, peas, and soymilk and soy products. Soluble fibre can also help with constipation.

Insoluble fibre - includes cellulose, hemicelluloses and lignin, which make up the structural parts of plant cell walls. A major role of insoluble fibre is to add bulk to faeces and prevent constipation and associated problems such as hemorrhoids. Good sources include wheat bran, corn bran, rice bran, the skins of fruits and vegetables, nuts, seeds, dried beans and wholegrain foods.

One can increase fibre by incorporating whole cereals, whole pulses, vegetables and fruits. Indians eat vegetables in good amount but preparation involves lot of fats. Eat raw and cooked vegetables with little or no fat, coconut, nuts, sauces, or dressings. Try low-fat or fat-free salad dressing on raw vegetables or salads. Steam vegetables using a small amount of water or low-fat broth. Mix in some chopped onion or garlic.

It is myth that diabetic should not consume fruit as they increase the blood sugars. Fruits are the only food group, which is eaten, in raw and natural form. Rich in fibre, vitamins, minerals and antioxidants fruit should be consumed on daily basis in moderation.

A diabetic is always confused which fruits should he eat and how much. Fruits can be divided in three categories- high calorie fruits (avocado, mango, banana, chikkoo, custard apple, grapes and jackfruits) moderate calories (apple, papaya, pineapple, pear, jamun) and low calorie fruits (citrus fruits, two slices of melons and guava). In a day a diabetic can eat half serving of high calorie fruit, one serving of moderate calorie fruit or 2 servings of low calorie fruits.

Vitamins and minerals

Required in minute amount but are essential for health. Some may even have pharmacological i.e. they can help to treat diseases or conditions.

A balanced diet usually provided the required vitamins and minerals. Should be taken in pharmacological form only on indication.

Salt intake

High salt or salt rich foods (papads, pickles, bakery products, canned foods, etc) are associated with high blood pressure and increase kidney load, it is recommended a diabetic should restrict salt rich foods and limit the intake of salt –one teaspoon per day.

Alcohol

Alcohol can lower or increase blood sugars depending upon the type and amount of alcohol consumed, consumed empty stomach or with food, blood sugars at time of drinking. Sometimes it can lead to lower the blood sugars to the extent that can lead to coma or death. To prevent such complication it should not be taken on empty stomach and intake of food should be followed.

For persons with diabetes, the same precautions apply regarding the use of alcohol that applies to the general population. Abstention from alcohol should be advised for women during pregnancy and for people with other medical problems such liver or pancreas disorder diabetic complication involving peripheral

nerves, high triglyceride levels or alcohol abuse. If individuals choose to drink alcohol, no more than two alcohol containing drinks per day for adult men and no more than one drink per day for adult women is recommended. One drink, or alcoholic beverage, is commonly defined as 12 oz of beer, 5 oz of wine, or 1.5 oz of distilled spirits, each of which contains 15 g of alcohol.

PUTTING IT ALL TOGETHER

Balance your nutritional requirements with food intake

Consume a variety of foods. Pick from all food group (don't miss the protein group.)

Include whole grains, whole pulses, vegetables and fruits in your daily diet to meet your macro and micro nutrient requirement and to increase fibre in the diet.

Restrict simple carbohydrate, fat and salt rich foods.

Avoid alcohol. If you drink alcohol, drink within recommended limits

Use food labels to help you identify sources of the different nutrients.