
Dietary Prescription in Diabetics

ABSTRACT: *Diabetes is a commonest disorder encountered by most of us in present days. The incidence is seen more common in younger age group. It might be due to inheritance or high stress conditions at work place or early frustrations or easy disappointments. Whatever may be the causative factors, Homeopathic science has the answer in understanding them as well as curing them. Dietary prescription is as important as selecting the right simillimum as Diabetes is a disorder of metabolism. Many times our medicine is correct but if we don't advice proper diet and auxiliary methods then we will surely fail. This article is written keeping in view the latest updates.*

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DIETARY PRESCRIPTION IN DIABETICS

"When diet is wrong, medicine is of no use.

When diet is correct, medicine is of no need."

Diet plays an important role in diabetes. The aim of any Diabetic is to achieve normal or near normal blood sugar level to the extent possible and to correct the abnormal state of carbohydrate and fat metabolism. To achieve this, the diet plays a major role. Diabetic diet is neither a complicated diet nor a complete deviation from normal diet. The nutritional requirements of diabetics are same as in nondiabetic individuals. Normal Indian diets are high in carbohydrates and low in fat, with carbohydrates providing 60-65% and fat providing 15-25% of total calories. The rest is derived from proteins. Many Nutritionists believe that a normal Traditional Indian diet is ideal for a diabetic. It should be in correct quantity depending upon the physical activity of the individual. Eating correctly doesn't mean that a North Indian eating rice and rasam or South Indian eating parathas and drinking lassi. It should be according to the taste and region that the patient belongs to. However the **nutrient intake should be tailor made based on age, sex, weight, height, physical activity and physiological needs of the individual patient.** It should be simple and practical. Rigid dietary schedule ends in failure. Participation and cooperation of the patient and their family members is very essential in planning out a dietary prescription. Before a diet is prescribed to a person it is necessary to understand

1. Dietary habits of the person
2. Weight and routine habits
3. Severity of diabetes and
4. Associated complications.

In most of the adult diabetics over weight is a common association. Therefore obesity should be taken into consideration while giving dietary advice.

WHAT IS OBESITY AND OVERWEIGHT?

- Over-weight and obesity are defined

as abnormal or excessive fat accumulation that may impair health.

- WHO defines over weight – BMI > 25 and obesity > 30.

TOOLS TO ASSESS OBESITY

- Body mass index [BMI]- Quetelet index =Kg/m²
=body weight in Kg/ (height in metre)².

DEFINITION OF OBESITY USING BODY MASS INDEX

CLASSIFICATION	BMI (KG/M ²)
Underweight	< 18.5
Normal Weight	19 - 24.9
Overweight	25 - 29.9
Class I Obesity	30 -34.9
Class II Obesity	35 - 39.9
Class III Obesity	> or = 40

Dietary prescription for an individual patient depends on the day-to-day activity including his/her current dietary history. A detail of how much quantity is consumed has to be mentioned. It is as important as we take every details of the Homoeopathic case history. It helps in deciding dietary prescription in each individual case. Total requirements of calories are to be calculated based on the nature of the physical activity, body weight and dietary history of the patient in each individual case. Average sized man for mild work would require about 1200 to 1400 calories a day while moderate work would demand 1500-2000 calories. Persons engaged in manual work would demand 2000-2500 calories a day. Requirement of mild work has been found out to be about 15-20 cal/kg body weight and persons involved in heavy labour require 30-35 cal/kg body weight.

DISTRIBUTION OF NUTRIENTS IN THE TOTAL CALORIES

The total daily intake of calories for a diabetic should be distributed in the following way:

Distribution of Calories

Carbohydrate	60-65%
Protein	15-20%
Fat	15-25%

CARBOHYDRATES

Indian diet mainly consists of carbohydrates. 1gram of carbohydrate provides 4Kcals of energy. Diabetics need not restrict the carbohydrate intake, but they can alter the type of carbohydrate in their diet. Cereals and pulses contain complex carbohydrates, which are broken down into simple sugars before they are absorbed from the gut. **Sugar, honey, jaggery and jam contain simple sugars which are directly absorbed. They are referred to as refined carbohydrates and are not recommended for diabetics, as they cause rapid rise in blood sugar level.** Sugars present in fruits and milk raise the blood sugar at a slightly slower rate. Usually it is recommended that the total amount of the carbohydrates can be conveniently divided into 4-5 equal parts. One-third (33%) of the diet is served during lunch and another one third (33%) during dinner. Remaining one third, 25% is served during breakfast and the rest 9% during evening tea or at bedtime.

PROTEINS

Proteins are essential for growth, development and tissue repair. When needed, they provide energy in the body. 1gram of protein provides 4 Kcal of energy. Proteins taken in the diet are broken down into amino acids before absorption in to the blood. The recommended Dietary Allowance for protein is 1.0 g/kg body weight. **Meat and meat products, pulses, legumes and nuts are all rich sources of protein.** In diabetics who are associated with renal problems, protein is restricted to 0.6g/kg body weight. In insulin-dependent diabetic children, 1-1.5g of protein/kg body weight is recommended.

FATS

Fats are concentrated sources of energy. 1gram of fat yields 9 Kcal of energy. Excess intake of fat thus increases body fat and leads to obesity. Fats contain essential fatty acids, and are also vehicles for fat-soluble vitamins such as vitamins A, D, E and K.

There are three types of fats. Ghee, butter,

vanaspathi and coconut oil which contain a high proportion of *saturated fats* which are likely to increase the serum cholesterol. They should be taken in small quantities. Excess of fats induces nausea, vomiting and gaseous distension. Excess of fats deposited in the blood vessels result in hardening of their walls and high blood pressure. Hence a diabetic should take care to see that fats are not consumed in excess. **Vegetable fats, such as sunflower and safflower oil, contain polyunsaturated fatty acids (PUFA) which are considered good for health.** *Monounsaturated fatty acids*, present in groundnut, palm oil and olive oil are not harmful to body.

Both the total quantity, as well as the type of fat influence the serum lipids and could increase the risk for heart diseases. Since serum lipids are generally raised in diabetes, diabetics have to be careful with the amount and nature of fat they consume. Non-vegetarian diabetics can consume fish or chicken without the skin, instead of egg, mutton, liver and brain which are high in cholesterol. Fatty acids present in fish are particularly helpful. Persons with high serum lipids or obesity should restrict their fat consumption particularly of saturated fats.

The type of fatty acid predominant in oil plays a major role in determining its health effects: Saturated fatty acids (SFA) is a bad fatty acid, mono unsaturated fatty acid (MUFA) is good fatty acid, poly unsaturated fatty acid (PUFA) are n-6 and n-3 fatty acids, which are a combination of bad and good and trans fatty acids (TFA) are very bad fatty acids.

For Indians, using a combination of oil rich in MUFA and n-3 PUFA is preferable than using a single oil.

Oils with high SFA content (bad fatty acid) are: coconut oil (91%), palm oil (45%) and ghee (65%).

MUFA rich oils (good fatty acid) include: olive oil (75%), canola oil (61%), groundnut oil (50%), rice bran oil (42.5%), and palm oil (40%).

Oils rich in n-3 PUFA (usually lacking in Indian

diet) include: Linseed oil (55%), mustard oil (10%), soya bean oil (7%) and rice bran oil (1%). Mustard and canola oil have shown to exhibit similar properties, but mustard oil has high concentration of erucic acid which may be harmful.

Oils rich in n-6 PUFA include: soya bean oil (50%), olive oil (10%) and mustard oil (18%).

VITAMINS AND MINERALS

These are protective and are essential for body in small amounts. They are abundantly found in green leafy vegetables, fresh fruits, milk and dairy products, cereals, nuts, fish and egg. Daily intake of these foods can provide enough vitamins and minerals.

Minerals especially salts need to be taken carefully. Excess of salt lead to water retention in the body and are likely to worsen high blood pressure a constant association with diabetes. A combination of these two with an excess of fats is an important risk factor for strokes and heart attacks. Stored and tinned food items are chief sources of high salt intake and hence need to be restricted.

DIETARY FIBRE

Dietary fibre is that part of food that is not digested by the gut and is considered as unavailable carbohydrate. It is not a single entity, but consists of a wide range of complex carbohydrates. Fibre present in vegetables, fruits, legumes, and fenugreek seed is soluble in nature and more effective in controlling blood sugar and serum lipids than the insoluble fibre present in cereals and millets.

Diets containing high dietary fibre can reduce blood sugar, serum cholesterol and relieve constipation. In addition, dietary fibre is beneficial in the prevention and treatment of several diseases such as cardiovascular diseases and colon cancer. Excess dietary fibre may cause gastrointestinal symptoms such as flatulence and diarrhea. Intake of 25 g of dietary fibre per 1000 calories is considered to be optimum for a diabetic.

DIETARY FIBRE CONTENT OF SOME COMMON INDIAN FOODS

Food	Dietary Fibre (g/100g)
Cereals and Millets	
Rice	7.6
Wheat	17.6
Sorghum	14.3
Bajra	20.3
Ragi	18.6
Pulses and Legumes	
Green gram dal	13.5
Black gram dal	14.3
Red gram dal	14.1
Bengal gram dal	13.6
Nuts and Oil seeds	
Groundnut	6.1
Coconut dry (copra)	8.9
Roots and Tubers	
Sweet potato	7.3
Potato	4.0
Yam	5.3
Fruits	
Banana	2.5
Mango	2.3
Vegetables	
Amaranth	3.4
Palak	5.0
Brinjal	2.0
Ridge gourd	5.7
Snake gourd	1.8
Bottle gourd	2.8
Yellow pumpkin	0.5

SOURCE: B S Narasinga Rao, Nutrition Foundation of India Bulletin, 9: (4), 1988.

FENUGREEK SEEDS

Fenugreek (*Trigonella foenum graecum*) is a common herb. This is commonly known as Methi. These seeds are commonly used as a condiment for seasoning in Indian homes. The medicinal quantities of fenugreek seeds are known since ancient times and have been described in Greek, Latin and Ayurvedic literature. It is reported

that a decoction of fenugreek seeds suppresses the urinary excretion of sugar and relieves symptoms of diabetes. Seeds of fenugreek are rich source of fibre. It contains mucilaginous fibre. In addition, it also contains trigonelline- an alkaloid, known to reduce blood sugar level. Fenugreek seed powder in the diet reduces blood sugar and urine sugar with concomitant improvement in glucose tolerance and diabetic symptoms in both non-insulin dependent and insulin dependent diabetic patients. It also lowers the level of serum lipids such as cholesterol and triglyceride.

In short, the diabetic should

- Avoid sweets
- Use fats in limited amounts
- Take cereals and pulses in right amount
- Include high fibre foods as much as possible
- Take vegetables as desired
- Take permitted fruits in limited quantities.

FRUITS WHICH CAN MAKE YOU OBESE

Fructose, the natural sugar found in fresh fruits is one of main causes for obesity. Remember many fruits are very high in sugar content and snacking on them all day can lead to obesity and diabetics have to take care in choosing right fruits for their diet. Nutritionist says that "There is a difference between foods with sugar content and fattening food. Fruits like apples, pears, oranges, and others are not fattening but have heaps of natural sugar content, which like all things- is good in small amounts. The problem arises if you eat 20 pieces of fruit. The recommended serving is 1-3 pieces per day". People think they are playing safe by having fruit juices instead of soft drinks but still end up adding more fat and sugar content in body. A typical fruit juice contains about 11.5 g of carbs per 100ml while a sweetened cold drink has 10.3g per 100ml. Moreover, by adding artificial sugar to fruits which are already sweet in nature, people are just inviting more trouble to their bodies. A fruit in it self won't pose any threat. If when one adds table sugar to fruits in salads or

juices that increases the level of sugar in the dish, causing fattening problems and rise in sugar levels in diabetics. Eating the skin of the fruit which has important nutrients can help negate sugar content. Many nutritionists recommend fruit sugar (fructose) than table sugar (sucrose) which is less harmful and Fructose is broken down more slowly which allows the body more time to react.

FRUIT SUGAR TABLE

HIGH SUGAR

- Apples
- Cherries
- Grapes
- Mangoes
- Pears
- Pineapple
- Pomegranates
- Bananas
- Figs
- Prunes
- Dried Fruits

LOW SUGAR

- Berries
- Watermelon
- Melons
- Tomatoes
- Apricots
- Grapefruit
- Guava
- Limes
- Oranges
- Papayas
- Peaches

WRONG BELIEFS

There is a common belief that diabetics can eat wheat but not rice. This is not true. Both wheat and rice have almost similar glycemic index and raise blood sugar to a similar extent. Therefore, *it should not matter whether one takes wheat or rice, as long as the total quantity is restricted.*

Total fasting is also not good for those who are on oral medicines or insulin as it may result in hypoglycemia.

Earlier, there was a wrong notion that persons with diabetes should restrict carbohydrates. It is now recommended that carbohydrates need not be restricted and that the normal Indian diet which provides 60-65% of calories from carbohydrates is right for diabetics. Complex carbohydrates present in cereals and pulses are better for diabetics than sweets containing simple sugars. Dieting or reducing diet may not yield expected results early. This will lead to giddiness and loss of stamina. One should be advised to live on a low fat diet especially vegetarian

diet. It has low fat and cholesterol with high fiber content. Statistics show that vegetarians are at low risk of coronary heart diseases and other major illnesses.

EXERCISE

Next to diet, exercise is an important aspect of diabetic management. Exercises can be done anywhere, both indoor and outdoor. It increase body activities and hence helps to consume excess calories in the body. It also helps to melt away excess body fat and help in losing extra weight. Exercises improve stamina, physical endurance and psychological well-being of the person. Persons with diabetes are therefore recommended to exercise regularly. These include brisk walking, jogging, bicycling, swimming, and playing badminton and tennis. It should become a part of daily routine. In addition exercise is known to reduce stress and strain and enhance the quality of life. The pace and duration of exercise, however, can be decided depending on the age and physical fitness of the subject. Remember **prescription of exercises is to be individualized**. It should suit to the individual according to their liking, stamina and health conditions. Otherwise it can precipitate complications. Before advising any exercise regime it is necessary to have a thorough medical check up. Presence of high blood pressure or heart diseases would have to be known before exercise programme is planned. Increase in the intensity of exercise should be gradual.

Care should be taken to protect the feet during exercise. Extremes of temperature should be avoided. Exercises are recommended for a minimum period of 45 minutes a day and 5 times a week. Exercises should be increased gradually. Exercises consume calories and hence reduce blood sugar levels. Therefore exercises should

not be done on an empty stomach or after taking medication that reduce blood sugar levels. Light snacks and fluids should be taken before, during or after exercise so that blood sugar is well maintained with in normal limits. Clothing while exercising should be loose and comfortable. Venue should be well ventilated. Remember extra workouts should not be done if one gets tired or exhausted or feels uncomfortable.

YOGIC POSTURES USEFUL IN DIABETIC'S: Yoga is a very good science which is practiced by most people in these modern days. Those who practice them regularly find tremendous change in their energy levels as well as activity levels. These are some of the suggested postures useful in Diabetics.

- Soorya Namaskaras
- Halasan
- Pavanamuktasan
- Dhanurasan
- Ardha Maschandrasan
- Ardha Paschimothasan
- Nowkasan

EDUCATION

Diabetics should be educated on the nature of the disease they have and possibility of development of acute and long term complications of the disease, if blood sugar is not kept under control. Diabetics should be informed about the symptoms of hypoglycemia and the immediate need for taking sugar in such conditions. Diabetic patients should be advised to maintain a diary and to keep a record of their urinary and blood sugar results, body weight and alterations in their diet. A Diabetic can live comfortably well, if he understands and realizes the need for a regular check up and complies with the guidelines of management.

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Exercise - A Boon for Diabetics

ABSTRACT: Generally exercise is considered to be a standard of care for glycaemic control. Hypertension is a common co-morbid condition with DM. DM is associated with dysfunction of various organs especially cardiovascular.

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Studies show 39% lower mortality amongst diabetics and decrease in Blood pressure of 6/6 mm Hg with 30-60 minutes of physical activity per week in previously sedentary hypertensive cum diabetic subjects. However, there were no further deductions in Blood pressure with further increases in amount of exercise time. In older diabetics, who had moderate hypertension and who performed endurance exercise for 7 months the reduction in systolic BP was 11mm Hg along with significant regression of left ventricular mass and concentric left ventricular re-modeling.

EXERCISE AND ENDOTHELIAL VASODILATATION: Exercise increases the blood flow to active muscles; the elevated shear stress on the vessel walls stimulates the production of endothelial-derived Nitric oxide that leads to vasodilatation. Growth factors are released during bouts of exercise, mediating arterial stiffness, increase in heart rate and BP during exercise. The balance between the two ultimately decides the beneficial effects of any exercise in the human body.

OUR EXPERIENCE: At the Department of Homoeopathic Cardiology of the Academy, we conducted a study to evaluate the clinical benefits of planned exercise in patients with established Type II DM with Ischemic Heart Disease and Hypertension. We followed up 48 patients aged between 33 to 76 years, of both sexes, suffering from the above-mentioned diseases and advised brisk walking for 3 Kilometers for 45 minutes/day for 12 weeks from 1/8/2007 to 30/

10/2007. All these patients were under homoeopathic management.

OBSERVATIONS: 71% patients complied sincerely. A remarkable glycaemic cum BP control was achieved in 56% of those who had performed it sincerely. As much as 10 Units of insulin/day could be reduced in 4 persons who were on Human insulin since 7-8 years. We have also observed that obesity is significantly associated with DM, high BP and cholesterol, asthma, arthritis and an overall poor health status. TV watching is associated with a high risk of obesity and DM.

GUIDELINES FOR EXERCISE TRAINING: Based on scientific evidence, exercise guidelines have been published for DM. It is recommended that patients should first undergo exercise stress testing before initiating a moderate-intensity exercise programme. It identifies ischemia, arrhythmias, anginal thresholds and provides data about heart rate and BP responses for establishing an appropriate exercise prescription.

1. For most patients exercising for 3 days/week is sufficient to maintain a good glycemic status. More frequent sessions are required when weight loss is a goal.
2. A period of 5-10 minutes each for warm up and cool down (stretching and jogging at a place) is essential.
3. Aerobic exercise consists of activities like walking, cycling, swimming and rowing. They should be done for 30-45 minutes for 3-4 times /week.