

Dietary Management of Diabetes

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Goals of Nutrition Therapy

To ensure the diabetic individual full life and normal longevity is the ultimate goal of nutrition therapy. Nutrition plan for diabetes serves to diminish the effects of the disease by maintaining a normal metabolic state. Specific and general goals for nutrition therapy can be listed as:

- Specific*
- To achieve physiologic blood glucose levels.
 - To maintain desirable plasma lipids levels.
 - To reduce the likelihood of specific diabetic complications.
 - To retard the development of atherosclerosis.
- General*
- To attain and maintain a desirable body weight.
 - To meet energy needs in a timely manner.
 - To provide an optimal selection of nutrients.
 - To individuals as per preferences and food available.

Variation in Nutritional needs for IDDM and NIDDM types.

In diabetic child (IDDM), energy intake should be related to height and weight growth chart as their insulin requirement may vary (generally 1.0 - 1.5 units/kg weight per day) during growth. In adults, energy expenditure depends on occupations based activity and thus caloric intake needs to be appropriately adjusted. Further, the adjustments in diet to avoid hypoglycaemia are a major factor for children with diabetes. Current food exchange lists are related to the net carbohydrate content. Dependence on absolute carbohydrate content of food for regulating diabetes has limitations as food with similar quantities of carbohydrates vary in their glycaemic response after ingestion. As regards free sugar, small quantities as part of mixed meal can be given.

Standard for Dietary Management

Maintenance of ideal body weight

Moderate energy restriction reduces blood glucose concentration and leads to symptomatic improvement within days or weeks. In most cases it

often does so before there is any detectable fall in body weight. Diet should therefore, always be the first consideration in treating NIDDM. Prolonged dietary restriction with considerable weight loss is required to achieve a normal glycaemic status. The motto for weight loss should be to achieve an ideal body weight as derived from actuarial tables according to age and sex, prepared by life insurance companies. In order to avoid confusing terms of body frame size such as large, medium and small, body mass index (BMI) (Wt/Ht^2) is considered as better indicator of ideal body weight. Normal values for males are 20-25, normal values for females 19-24. Above the BMI value of 24, the person is considered as obese. While discussing ideal body weight may be instructive for some patients it may be too daunting for others. A short-term target weight within a definite time frame is a useful form of contract between the patient and doctor or dietician.

Proportions of Dietary Constituents

Once the caloric requirements of diabetic individual is decided upon the distribution of calories holds the key to the meal plan. Distribution of calories throughout the day and the proportion of carbohydrates, proteins and fats in the food can be worked out as follows:

* Carbohydrates (Complex)	50 – 65%
* Fats	< 25%
Saturated fatty acids	< 8%
Polyunsaturated fatty acid	10%
Monounsaturated fatty acid	7%
Dietary Cholesterol	< 300 mg
* Proteins	10 – 15%
* Dietary fibre	40 – 50 g/24 hr. or 25 g/1000 k cal.
* Salt	< 6 gm/24 hr.

IDDM patients need to be advised frequent small meals i.e. we need to plan a mid morning, mid afternoon and bedtime snack, besides breakfast, lunch and dinner. This is to minimize the fluctuations in blood glucose. Meal plan should also take into consideration the medication being advised. Density of carbohydrates in a meal would depend upon the peak action time of insulin or medications. In NIDDM three meal pattern will suffice. Administration of an oral hypoglycaemic agent should be adjusted accordingly.

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Plant foods and products requirement

Vegetables and fruits are a rich source of several nutrients. They are relatively low in energy but high in fibre (especially leafy vegetables). It is recommended that 400 g/day of vegetables and fruits should be included in the diet. Many of the plant products are considered as a popular remedy for diabetes in Indian sub-continent. Some of these are Neem leaves, Karela juice, Jamboos fruit seeds, Fenugreek seeds and chiryata. These products improve glucose tolerance in NIDDM but are not a cure for diabetes and do not replace the need for a prudent diet.

Serum lipids and Diabetes

Hypercholesterolaemia and hypertriglyceridaemia are the common lipid abnormalities seen in diabetics. As triglycerides are inversely related to HDL, with hypertriglyceridaemia diabetics may also have low HDL levels. Red meat, organ meat, whole milk and its products, butter, pure ghee and processed cheese should be excluded from diet to avoid excess cholesterol intake. Calories from fat and distribution of fatty acids in diet should be as listed above. Along with a restricted intake of fat a high soluble fibre diet and regular exercise is also essential.

Minerals and Vitamins

Supplements of minerals and vitamins are usually not required when a good balanced diet is being consumed by a diabetic. However, under the

following conditions, inclusion of appropriate supplements may be considered.

- a. Diabetic on very low calorie diet
- b. Diabetics with pregnancy
- c. Diabetics with malabsorption
- d. Diabetics on long term biguanides
- e. Elderly diabetics with osteoporosis

Supplements of zinc and magnesium are being prescribed for diabetics in some countries. Presence of antioxidants or foods rich in antioxidants like B carotene, vitamin C and vitamin E will prevent oxidation of LDL or may prevent vascular complications.

Tailoring the diet to the individual needs is probably the most difficult task in the management of diabetes. In doing so, dietician must consider the activity level, work schedule, meal schedule, food preferences and other factors. Individualized nutritional plan should be compatible as possible with the food habits and life style of the patient. Lastly of utmost importance is the patient's motivation to follow the plan. Adequate follow-up and re-evaluation of nutritional plan should be provided. Growth related record in children and weight maintenance record in adult is the most important index of success of nutritional management in diabetics.