

TYPE 2 DIABETES AND DIET

Type 2 diabetes

Type 2 diabetes was previously called non-insulin –dependent diabetes. It is the most common form of diabetes, though obesity (excessive accumulation of body fat) increases the risk of diabetes, it is also seen in adults who are not obese, but who may have central (abdominal) obesity. In other words, centrally distributed abdominal body fat (abdominal adiposity) is also known to increase insulin resistance and diabetes type 2. In subjects with this type of diabetes, diet control, physical activity and oral anti-diabetic drugs may be enough to control the raised blood glucose

Prevalence: It is estimated that about 9 % Indians suffer from Diabetes. Prevalence of diabetes is 2-3 fold higher in urban than in rural India and occurs at a much younger age in Indians. More than 90% of all diabetes belongs to type 2 diabetes. It is generally believed that diabetes is more prevalent in affluent societies where obesity is a major health problem. However, diabetes exists in all populations with variations in prevalence between ethnic groups and geographic areas. Despite the widely prevalent under nutrition, India currently has 62.4 million diabetics (ICMR study). Based on current rates, prevalence of diabetes in India is expected to reach 100 million by 2030.

Type 2 diabetes is preventable. Physical activity and diet regulations are important factors to control diabetes. University of Michigan Health System show that men and women who walked for 30 minutes five days a week, decreased their fat and total calorie intake, and reduced their body weight by 7% over a period of three years were able to cut their risk of developing type 2 diabetes by 58% (1). Similar results were seen in studies of weight loss, exercise, and dietary change, conducted in Finland and Chinese (2,3,4).

Symptoms

Many diabetics may not be aware that they have diabetes. Quite often, they come to know of it only during a routine medical check-up. The following symptoms in an otherwise healthy person should make one suspect that he or she may have diabetes

- Increased appetite and thirst
- Frequent urination (polyuria)
- Loss of weight
- Lethargy and Sleepiness
- Slow healing of cuts and wounds

Risk factors for Type 2 Diabetes

Why do we develop diabetes type 2 ?

1. **BMI:** Indians are unique! We are at risk of Type 2 Diabetes at a lower BMI. We, in India may develop Type 2 diabetes at much younger age and at lower BMI. Body Mass Index (BMI) is an

excellent indicator of the weight status of a person. It is defined as the weight in (kg) divided by height in m^2 . A healthy BMI for Indian adults is between 19 and 22. Diabetes is a common consequence of overweight and obesity in adults. Obesity itself is a strong risk factor.

Body fat percentage is generally accepted as a better gauge of fitness than weight. When in ideal shape, body fat will make up about 14% - 17% of a male's body weight and 21% - 24% of a female's. The remainder of the body's weight is composed of water (55%-60%), muscle and other lean tissue (10%-20%), and bone and minerals (6%-8%).

2. Waist to Hip Ratio: Research has shown that more than the weight of a person, it is the shape of the body which is important in determining risks for the development of many diseases such as diabetes, high blood pressure, lipid disorders, and atherosclerosis leading to cardiovascular diseases (CVD) and stroke. Research shows that people with "apple-shaped" bodies (with more weight around the waist) are at higher risk than those with "pear-shaped" bodies that is more weight around the hips. Waist-Hip Ratio (WHR) used along with BMI is better in predicting risk for many of the serious disorders such as diabetes, high blood pressure etc. Waist-Hip Ratio of more than 0.80 is high risk for women; more than 0.95 is high risk for men.

Apple-shaped body is due to accumulation of more fat around the viscera. Visceral Fat also called abdominal obesity or central obesity is well known to increase insulin resistance. Several lines of evidence have suggested the role of visceral fat (VF) accumulation in the pathogenesis of insulin resistance. Thus, VF excess has been associated with decreased glucose uptake by cells to insulin stimulation, reduced rate of free fatty acids (FFA) reesterification (therefore more FFA in the circulation), increased resistance of lipolysis to the inhibitory effect of insulin in both visceral and peripheral adipocytes .

- Measure waist at navel while standing relaxed, not pulling in your stomach.
- Measure around hips, over the buttocks at the widest part of the buttocks.
- Divide the waist measure by the hip measure; this gives waist hip ratio (WHR).

3. Physical activity: Physical activity has an important role to play in diabetes treatment as in any weight management regimen. Regular exercise can increase the sensitivity of the body tissues to insulin by more than 30%. Long hours of sweaty exercise are not required to keep blood sugar under control. Many studies suggest that walking briskly for a half hour every day reduces the risk of developing type 2 diabetes by 30 percent. Physical activity helps to correct the associated lipid abnormalities, increases cardiovascular fitness as well.

4. Healthy eating habit can prevent diabetes: What we eat impacts our blood sugar levels. Foods that contain refined carbohydrates, whether as starches or sugars, will raise blood sugar and increase insulin resistance. Refined carbohydrates are usually found in pastries, biscuits and cakes. Also, for example, brown rice should be preferred over polished white rice. Similarly, whole wheat roties/ phulkas (Indian bread) should be preferred over white bread. A diet high in fat or calorie, or a diet high in Omega-6 fatty acids (n-6) and low in omega-3 fatty acid (n-3) will cause inflammation.

Inflammation is the root cause of many life style diseases such as metabolic syndrome, insulin resistance, type 2 diabetes, coronary heart disease, endothelial dysfunction, prothrombotic processes, stroke and Alzheimer's disease. To reduce inflammation prefer whole and fresh fruits over fruit juices.

Green leafy vegetables also help reduce inflammation because they are low in starchy carbohydrates and full of fiber, minerals and vitamins. A high fat, high calorie, western type of diet will also increase inflammation. Correct ratio of omega-3 and Omega-6 fatty acids is important to maintain good health. Nuts (Walnuts, almonds, hazelnuts etc.) are rich in minerals, fibers, vitamins and omega-3 fatty acid. Eating nuts as part of a healthy diet is good. The calorie coming from nuts should be judiciously compensated by decreasing calorie intake from cereals or fats.

5. Yoga or meditation will help overcome stressful situations: Stressful situations can release hormones that will raise blood sugar.

6. Smoking and alcohol: Smoking and alcohol increase risk for insulin resistance, which often leads to diabetes. In diabetics, it increases the risk of complications, which include heart disease, stroke and circulation problems.

Diagnostic criteria for IFG, IGT and Diabetes

Different types	Plasma glucose level (mg/dl)	
	Fasting	2-hr post-load
Normal	<110	<140
Impaired fasting glucose (IFG)	110 to 125	<140*
Impaired glucose tolerance (IGT)	<126	≥140 and 200
Diabetes	≥126	≥200

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3. Lindstrom J, Ilanne-Parikka P, Peltonen M, et al. Sustained reduction in the incidence of type 2 diabetes by lifestyle intervention: follow-up of the Finnish Diabetes Prevention Study. *Lancet.* 2006; 368:1673-9.
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