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Diabetes & Kidney Failure

This booklet will help you to know in brief about kidneys & their functions, blood sugar level, Diabetes, types of Diabetes, causes and symptoms of Diabetes, how diabetes damages the kidneys & some tips to remain healthy with Diabetes

Kidneys are two bean-shaped organs, situated behind the stomach on either side of the vertebral column. Each kidney is capable of sustaining life independently. In other words, a person can lead a normal life even with one kidney. Kidneys are a part of the urinary system, which also consists of the ureters, urinary bladder and the urethra.

The kidneys remove wastes and extra water from the blood to form urine. If these wastes are not removed they can be harmful to the body.

In addition to removing wastes, kidneys release hormone Erythropoietin, hormone Renin & active form of vitamin D, help in balancing the body fluid by maintaining the right amount of water in the body and keep bones healthy.

What is Diabetes ?

A blood sugar level less than 110 mg/100 ml, fasting sugar - 12 hours, and less than 140 mg/100 ml after 2 hours of a meal indicate absence of Diabetes.

Presence of sugar in blood in excessive amounts is called Diabetes. Everyone has some sugar in their blood. The normal amount of sugar in the blood ranges from about 70 mg/100 ml to about 120 mg/100 ml. Blood sugar goes up after eating, but returns to the normal range in 1 or 2 hours.

Diabetes occurs due to failure of the Pancreas to produce enough of a hormone called insulin and/or the body becoming resistant to the action of insulin.

The Role of Insulin

Human body changes carbohydrate containing food into sugar (Glucose). Blood carries sugar to body cells. The sugar needs insulin to get into the body cells. The Pancreas releases insulin into the blood. Insulin helps the sugar from



blood to get into body cells. If body doesn't make enough insulin or the insulin doesn't work right, the sugar cannot get into the cells. It stays in the blood. This makes blood sugar level high, causing Diabetes.

This high blood sugar can damage many parts of the body, such as the kidneys, heart, eyes and blood vessels. Diabetes problems can be scary, but there is a lot one can do to prevent them or slow them down.

Diabetes is of two types

Type 1 known as **Insulin-Dependent Diabetes Mellitus** (IDDM) or juvenile-onset Diabetes is found in 5-10 % of diagnosed cases of Diabetes. This type occurs most frequently in children and adolescents, and is caused by the inability of the Pancreas to produce the insulin needed for survival.

Type 2 known as **Non-Insulin-Dependent Diabetes Mellitus** (NIDDM) or adult-onset Diabetes, affects the other 90-95 % of all diagnosed cases of Diabetes, many of which are controlled by oral medicine or insulin injections. The vast majority of these people (80 percent or more) are overweight. Obesity itself can cause insulin resistance.

Causes of Diabetes

1. Family history
2. Excessive weight
3. Too much sugary foods
4. Period of illness and stress
5. Certain medications

Symptoms of Diabetes

1. Being very thirsty
2. Urge to drink chilled water
3. High urine frequency
4. Feeling very hungry or tired
5. Weight loss
6. Slow healing of sores
7. Dry & itchy skin
8. Diminishing sensation in the feet
9. Blurry eyesight

One may have one or more of these signs before one comes to know, one has Diabetes.

Diabetes & Kidneys

Today, Diabetes is the most common cause of End Stage Renal Failure (ESRF). Around 40% of ESRF takes place secondary to Diabetes. Diabetes can cause diabetic kidney disease (also called Diabetic Nephropathy), which can lead to kidney failure. Controlling blood glucose can prevent or delay the onset of kidney disease. Keeping blood pressure under tight control is also important.

How does Diabetes damage the Kidneys?

Diabetic kidney damage is usually due to changes in small blood vessels leading to the filtering system of the kidney or to the smaller blood vessels within the filtering system itself.

Excess of sugar in the blood forms a complex with the

protein in the blood. This complex is called glycoprotein. These glycoproteins are very sticky substances & stick in the finest capillaries in our body which are present in the kidneys & the eyes. Higher the sugar level , more the chances of damage to the kidney.

Each capillary supplies blood to one Nephron (functioning unit) of the kidney. If the capillary is blocked then nutrition to that Nephron is stopped & it dies. Such events happen more & more if Diabetes is not diagnosed and treated in time. Ultimately the number of performing Nephrons reduces to an extent that kidneys can not sustain the normal function, a stage which is called kidney failure.

However, detection of early kidney damage is possible by testing the rate at which the kidneys are leaking a protein called albumin into the urine.

Staying healthy with Diabetes & preventing kidney damage

Follow a healthy eating plan which is worked out by patient and doctor.

1. Meals and snacks should be taken at around the same time each day.
2. Exercising for at least 30 minutes most days. Doctor should be consulted, for which exercises are best for you.
3. Diabetes medicine should be taken at the same time each day.
4. Blood sugar level should be checked every day. Doctor should be consulted if numbers are too high or too low, continuously for 2-3 days.
5. Feet should be checked every day for cuts, blisters, sores, swelling, etc. Wear cotton socks all the time.

6. Teeth and gums should be brushed everyday.
7. Smoking should be stopped.
8. When Diabetes is for more than 5 years, check for albumin in urine. (Microalbumin)
9. Regular eye checkup.
10. Keep blood pressure very well controlled.

Keywords:

Diabetes, Insulin, Blood sugar level

Please also refer the following information booklets from India Renal Foundation for more information.

1. Choosing Your Treatment
2. Haemodialysis
3. Peritoneal Dialysis
4. Kidney Transplantation
5. Hypertension and Kidney Failure
6. Kidney Failure and Anemia
7. Kidney stones and Kidney Failure

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