

A Review- Obesity & Diabetic Nephropathy

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Abstract- Obesity is a very complex disease involving an excessive amount of body fat. It has become a serious worldwide problem now. More than 300 million adults are classified as obese and the global number is predicted to reach 700 million by 2015. In past, obesity was not a common condition among the population of China, however. Obesity & Diabetic nephropathy are completely different disorders. Obesity and diabetes have become a growing challenge, and one million new diabetic cases are reported in China every year. Obesity is caused due to deposition of excessive fat whereas diabetic nephropathy is a kidney damage caused due to diabetes (excess blood sugar level). Both are leading disorders that could be overcome by maintaining diet somewhere. Increasing evidence suggests that obesity is a risk factor for diabetes and chronic kidney diseases. As a marker of obesity, high body mass index (BMI) has been reported to be related with diabetic nephropathy (DN) and end-stage renal disease (ESRD).

Keywords: Obesity, Heart disease, Diabetes, inheritance, Sleep apnoea, osteoarthritis, BMI, kidney disease.

INTRODUCTION

OBESITY-

Obesity is a very complex disease involving an excessive amount of body fat. It is a medical problem that increases risk of other diseases and health problems, Like-

1. Heart disease
2. Diabetes
3. High blood pressure
4. Certain cancers

People are having difficulty to avoiding obesity because it results from a combination of inherited factors, combined with the environment and personal diet and exercise choices.

On the other side modest weight loss can improve or prevent the health problems which are associated with obesity. Dietary changes increased physical activity and behaviour changes also can help to lose weight. [1]

These days obesity has become a serious worldwide problem. More than 300 million adults are classified

as obese and the global number is predicted to reach 700 million by 2015.

In the past, obesity was not a common condition among the population of China [2]. Obesity and diabetes have become a growing challenge, and one million new diabetic cases are reported in China every year. Increasing evidence suggests that obesity is a risk factor for diabetes and chronic kidney diseases. As a marker of obesity, high body mass index (BMI) has been reported to be related with diabetic nephropathy (DN) and end-stage renal disease (ESRD) [3].

DIABETIC NEPHROPATHY

It is also known as Diabetic Kidney Disease. It is kidney damage that caused due to diabetes. Having high blood glucose levels due to diabetes can damage the part of the kidneys that filters your blood. The damaged filter becomes 'leaky' and lets protein into your urine.

Diabetic nephropathy is common disorder. One in 4 women and one in 5 men with type 2 diabetes develops diabetic nephropathy. It is even more common in type 1 diabetes. Diabetic kidney disease is a leading cause of kidney failure in Australia.

Therefore, Obesity & Diabetic nephropathy are completely different disorders. Obesity is caused due to deposition of excessive fat whereas diabetic nephropathy is a kidney damage due to diabetes. But both are leading disorders that can be overcome by even maintaining diet.

DIABETES

The main function of the kidneys is to filter waste products and excess water from the bloodstream so that they can be excreted in the form of urine. This is carried out by a system of tubes and blood vessels known as nephrons. Inside the nephrons are tiny blood vessels called capillaries and tiny urine-collecting tubes. One of the major structures in the nephron is a

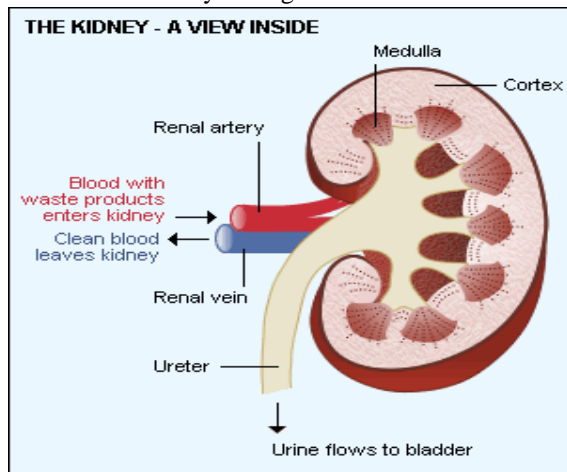
group of blood vessels known as the glomerulus, which acts as a filter.

Having high blood glucose levels can interfere with the function of the glomerulus. The filtering function of the kidneys doesn't work properly and proteins start to leak from the blood into the urine.

High blood glucose levels can also cause scarring of the glomerulus (called glomerulosclerosis). As the scarring gets worse, the kidneys stop being able to filter waste products from the blood.

When enough glomeruli have been damaged, kidney failure results.

People who have diabetic nephropathy also often have high blood pressure. High blood pressure can further contribute to kidney damage.



Risk factors for diabetic nephropathy

There are many factors that can increase your risk of developing diabetic nephropathy. These include:

- The length of time that you have had diabetes;
- Having high blood glucose levels (because your diabetes is not well managed);
- Having high blood pressure;
- Being overweight or obese; and
- Smoking.

Your risk is also higher if you have other problems related to your diabetes. These include diabetic retinopathy or diabetic neuropathy.

SYMPTOMS OF OBESITY & DIABETIC NEPHROPATHY

Obesity generally diagnosed when body mass index (BMI) is 30 or higher. For determination of body mass index, divide person's body weight in pounds by

person's height in inches squared and multiply by 703. Or divide person's body weight in kilograms by person's height in meters squared.

BMI	WEIGHT STATUS
Below 18.5	Underweight
18.5-24.9	Normal
25.0-29.9	Overweight
30.0 and higher	Obesity

Body mass index (BMI) provides a reasonable estimate of body fat.

On the other hand, Diabetic nephropathy usually has no symptoms early on. You can't tell that there is protein in your urine – it's something that is detected with a urine test.

If the kidney damage becomes severe, you may notice-

1. Weight loss
2. A poor appetite or feeling sick
3. Swollen ankles and feet (due to retaining fluid)
4. Puffiness around the eyes
5. Dry, itchy skin
6. Muscle cramps
7. Needing to pass urine more often
8. Feeling tired
9. Having difficulty concentrating

CAUSES OF OBESITY & DIABETIC NEPHROPATHY

Although there are genetic, behavioural, metabolic and hormonal influences on body weight, But Obesity occurs when a person takes more calories than they burn through exercise and normal daily activities. Human body stores these excess calories as fat.

Most Americans people's diets are very high in calories often from fast food and high-calorie beverages. People with obesity might eat more calories before feeling full, feel hungry sooner, or eat more due to stress or anxiety.

1. Family Inheritance & Influences-

The genes you inherit from your parents may affect the amount of body fat you store, and where that fat is distributed. Genetics may also play a role in how efficiently your body converts food into energy, how your body regulates your appetite and how your body burns calories during exercise.

Obesity tends to run in families. That's not just because of the genes they share. Family members also tend to share similar eating and activity habits.

2. Lifestyle Choices-

Unhealthy diet. A diet that's high in calories, lacking in fruits and vegetables, full of fast food, and laden with high-calorie beverages and oversized portions contributes to weight gain.

Liquid calories. People can drink many calories without feeling full, especially calories from alcohol. Other high-calorie beverages, such as sugared soft drinks, can contribute to significant weight gain.

Inactivity. If you have a sedentary lifestyle, you can easily take in more calories every day than you burn through exercise and routine daily activities. Looking at computer, tablet and phone screens is a sedentary activity. The number of hours you spend in front of a screen is highly associated with weight gain.

3. Certain disease & medication-

In some people, obesity can be traced to a medical cause, such as Prader-Willi syndrome, Cushing syndrome and other conditions. Medical problems, such as arthritis, also can lead to decreased activity, which may result in weight gain.

Some medications can lead to weight gain if you don't compensate through diet or activity. These medications include some antidepressants, anti-seizure medications, diabetes medications, antipsychotic medications, steroids and beta blockers.

4. Social & Economic issues-

Social and economic factors are linked to obesity. Avoiding obesity is difficult if you don't have safe areas to walk or exercise. Similarly, you may not have been taught healthy ways of cooking, or you may not have access to healthier foods. In addition, the people you spend time with may influence your weight — you're more likely to develop obesity if you have friends or relatives with obesity.

5. Age-

Obesity can occur at any age, even in young children. But as you age, hormonal changes and a less active lifestyle increase your risk of obesity. In addition, the amount of muscle in your body tends to decrease with age. Generally, lower muscle mass leads to a decrease in metabolism. These changes also reduce calorie needs, and can make it harder to keep off excess weight. If you don't consciously control what you eat

and become more physically active as you age, you'll likely gain weight.

6. Other factors-

- Pregnancy. Weight gain is common during pregnancy. Some women find this weight difficult to lose after the baby is born. This weight gain may contribute to the development of obesity in women. Breast-feeding may be the best option to lose the weight gained during pregnancy.
- Quitting smoking. Quitting smoking is often associated with weight gain. And for some, it can lead to enough weight gain to qualify as obesity. Often, this happens as people use food to cope with smoking withdrawal. In the long run, however, quitting smoking is still a greater benefit to your health than is continuing to smoke. Your doctor can help you prevent weight gain after quitting smoking.
- Lack of sleep. Not getting enough sleep or getting too much sleep can cause changes in hormones that increase your appetite. You may also crave foods high in calories and carbohydrates, which can contribute to weight gain.
- Stress. Many external factors that affect your mood and well-being may contribute to obesity. People often seek more high-calorie food when experiencing stressful situations.
- Microbiome. Your gut bacteria are affected by what you eat and may contribute to weight gain or difficulty losing weight.
- Previous attempts to lose weight. Previous attempts of weight loss followed by rapid weight regain may contribute to further weight gain. This phenomenon, sometimes called yo-yo dieting, can slow your metabolism. Even if you have one or more of these risk factors, it doesn't mean that you're destined to develop obesity. You can counteract most risk factors through diet, physical activity and exercise, and behaviour changes.

COMPLICATIONS OF OBESITY & DIABETIC NEPHROPATHY

People with obesity are more likely to develop a number of potentially serious health problems, including:

- Heart disease and strokes. Obesity makes you more likely to have high blood pressure and abnormal cholesterol levels, which are risk factors for heart disease and strokes.
- Type 2 diabetes. Obesity can affect the way your body uses insulin to control blood sugar levels. This raises your risk of insulin resistance and diabetes.
- Certain cancers. Obesity may increase your risk of cancer of the uterus, cervix, endometrium, ovary, breast, colon, rectum, oesophagus, liver, gallbladder, pancreas, kidney and prostate.
- Digestive problems. Obesity increases the likelihood that you'll develop heartburn, gallbladder disease and liver problems.
- Gynaecological and sexual problems. Obesity may cause infertility and irregular periods in women. Obesity also can cause erectile dysfunction in men.
- Sleep apnoea. People with obesity are more likely to have sleep apnea, a potentially serious disorder in which breathing repeatedly stops and starts during sleep.
- Osteoarthritis. Obesity increases the stress placed on weight-bearing joints, in addition to promoting inflammation within the body. These factors may lead to complications such as osteoarthritis.
- Severe COVID-19 symptoms. Obesity increases the risk of developing severe symptoms if you become infected with the virus that causes coronavirus disease 2019 (COVID-19). People who have severe cases of COVID-19 may require treatment in intensive care units or even mechanical assistance to breathe.

COMPLICATIONS

- The main complication of diabetic kidney disease is developing chronic kidney disease. Chronic kidney disease can progress even further to kidney failure. People with kidney failure need treatment with dialysis or a kidney transplant.
- All people with diabetes are at risk of high blood pressure and cardiovascular disease (e.g., heart disease, stroke). Having kidney disease also increases the risk of these problems. So having both diabetes and kidney disease means your risk is even higher.

- Having diabetic kidney disease can also make other diabetes complications (such as diabetic retinopathy and diabetic neuropathy) worse.

QUALITY OF LIFE

Obesity can diminish your overall quality of life. You may not be able to do things you used to do, such as participating in enjoyable activities. You may avoid public places. People with obesity may even encounter discrimination.

Other weight-related issues that may affect your quality of life include:

- Depression
- Disability
- Sexual problems
- Shame and guilt
- Social isolation
- Lower work achievement

PREVENTION OF OBESITY & DIABETIC NEPHROPATHY

Whether you're at risk of obesity, currently overweight or at a healthy weight, you can take steps to prevent unhealthy weight gain and related health problems. Not surprisingly, the steps to prevent weight gain are the same as the steps to lose weight: daily exercise, a healthy diet, and a long-term commitment to watch what you eat and drink.

- Exercise regularly. You need to get 150 to 300 minutes of moderate-intensity activity a week to prevent weight gain. Moderately intense physical activities include fast walking and swimming.
- Follow a healthy-eating plan. Focus on low-calorie, nutrient-dense foods, such as fruits, vegetables and whole grains. Avoid saturated fat and limit sweets and alcohol. Eat three regular meals a day with limited snacking. You can still enjoy small amounts of high-fat, high-calorie foods as an infrequent treat. Just be sure to choose foods that promote a healthy weight and good health most of the time.
- Know and avoid the food traps that cause you to eat. Identify situations that trigger out-of-control eating. Try keeping a journal and write down what you eat, how much you eat, when you eat, how

you're feeling and how hungry you are. After a while, you should see patterns emerge. You can plan ahead and develop strategies for handling these types of situations and stay in control of your eating behaviours.

- Monitor your weight regularly. People who weigh themselves at least once a week are more successful in keeping off excess pounds. Monitoring your weight can tell you whether your efforts are working and can help you detect small weight gains before they become big problems.
- Be consistent. Sticking to your healthy-weight plan during the week, on the weekends, and amidst vacation and holidays as much as possible increases your chances of long-term success.

TREATMENT FOR DIABETIC NEPHROPATHY

Early detection and treatment of diabetic nephropathy can not only stop the progression of kidney disease in people with diabetes, but during the early stages can actually reverse it. Treatment involves controlling both your blood glucose levels and your blood pressure.

Blood glucose levels should be kept in the normal range as much as possible to prevent or slow the progression of diabetic nephropathy. Lifestyle measures (including diet and exercise) in combination with oral diabetes medicines (oral hypoglycaemics) or insulin can be used to control blood glucose levels.

People with type 2 diabetes who have microalbuminuria or proteinuria (evidence of some degree of diabetic nephropathy) are usually also treated with medicines called angiotensin-converting enzyme inhibitors (ACE inhibitors) or angiotensin receptor blockers (ARBs). These medicines are also used to control blood pressure, but even if your blood pressure is normal, your doctor may prescribe an ACE inhibitor or ARB because they decrease the amount of protein in the urine and can prevent or slow the progression of diabetic kidney disease.

Other medicines may also be prescribed to help control high blood pressure.

PREVENTION

You can help protect your kidneys from damage due to diabetes by working with your doctor to:

- Make sure your blood glucose levels are well controlled;
- Make sure your blood pressure is in the healthy range;
- Stop smoking if you are a smoker;
- Maintain a healthy weight; and
- Control your cholesterol levels.

These measures can help reduce your risk of developing diabetic kidney disease or delay its onset. You should also have a kidney health check (which involves having a urine test, blood test and blood pressure test) at least once a year to check how well your kidneys are functioning.

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