

Relation between diabetes and renal failure

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Description

Diabetic nephropathy, also known as diabetic kidney disease, is a chronic complication that arises from diabetes mellitus and is a leading cause of renal failure worldwide. It is a progressive condition that affects the kidneys, leading to the impairment of their vital functions. In this article, we will delve into the intricacies of diabetic nephropathy, exploring its causes, symptoms, diagnosis, and available treatment options.

■ Causes and risk factors

Diabetic nephropathy primarily develops as a consequence of uncontrolled diabetes, especially in individuals with long-standing type 1 or type 2 diabetes. The elevated blood glucose levels in diabetes can cause damage to the small blood vessels within the kidneys, leading to impaired filtration and the accumulation of waste products. The exact mechanism behind this damage is complex and involves various factors such as genetic predisposition, inflammation, oxidative stress, and activation of the renin-angiotensin system. Additionally, certain risk factors like high blood pressure, smoking, obesity, and a family history of kidney disease can further increase the likelihood of developing diabetic nephropathy.

■ Symptoms and progression

In the early stages, diabetic nephropathy may not exhibit any noticeable symptoms. However, as the condition progresses, patients may experience the following:

Proteinuria, one of the hallmark signs of diabetic

nephropathy is the presence of excessive amounts of protein in the urine. This occurs due to the damaged filtration system in the kidneys, leading to the leakage of proteins into the urine.

Edema, fluid retention and swelling, especially in the lower extremities, are common manifestations of diabetic nephropathy.

Hypertension, high blood pressure often accompanies diabetic nephropathy, further exacerbating kidney damage.

Declining renal function, as the condition worsens; the kidneys' ability to filter waste products and excess fluids diminishes, eventually leading to renal failure.

■ Diagnosis

Diagnosing diabetic nephropathy involves a combination of medical history assessment, physical examination, and laboratory tests. The primary diagnostic tool is a urine test to detect the presence of albumin, a protein that indicates kidney damage. The ratio of albumin to creatinine in the urine sample, known as the albumin-to-creatinine ratio, helps determine the severity of proteinuria. Blood tests to assess kidney function, such as serum creatinine and estimated Glomerular Filtration Rate (eGFR), are also crucial in the diagnostic process. Additionally, imaging studies like ultrasound may be utilized to evaluate the size and structure of the kidneys.

■ Treatment and management

The management of diabetic nephropathy aims

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to slow down the progression of kidney damage, control symptoms, and prevent complications. The treatment approach involves a combination of lifestyle modifications and medical interventions. Key strategies include:

Blood sugar control, Maintaining optimal blood glucose levels through diet, exercise, and medications is crucial in preventing or delaying the onset of diabetic nephropathy.

Blood pressure management, strict control of blood pressure, usually through medications like Angiotensin-Converting Enzyme inhibitors (ACE inhibitors) or Angiotensin Receptor Blockers (ARBs), is vital in preserving kidney

function.

Protein restriction, a low-protein diet may be recommended to reduce the workload on the kidneys and minimize proteinuria.

Medications, other medications like diuretics to manage edema, lipid-lowering drugs to control cholesterol levels, and erythropoietin-stimulating agents to address anemia may be prescribed as necessary.

Dialysis and transplantation, in advanced stages of renal failure, dialysis or kidney transplantation may be necessary to replace the lost kidney function.