

# Treatment Options for Diabetic Nephropathy: Medications, Dialysis and Transplantation

Hong Aiguo\*

Department of Internal Medicine, Hungkuang University, Taichung, Taiwan

**Corresponding author:** Hong Aiguo, Department of Internal Medicine, Hungkuang University, Taichung, Taiwan, E-mail: aiguo hong@hu.ta.tw

**Received date:** September 19, 2024, Manuscript No. IPJCEN-24-19840; **Editor assigned date:** September 23, 2024, PreQC No. IPJCEN-24-19840 (PQ); **Reviewed date:** October 07, 2024, QC No. IPJCEN-24-19840; **Revised date:** October 14, 2024, Manuscript No. IPJCEN-24-19840 (R); **Published date:** October 21, 2024, DOI: 10.36648/2472-5056.9.5.275

**Citation:** Aiguo H (2024) Treatment Options for Diabetic Nephropathy: Medications, Dialysis and Transplantation. J Clin Exp Nephrol Vol.9 No.5: 275.

## Description

Diabetic nephropathy, a progressive kidney disease caused by long-term diabetes, is one of the most serious complications of diabetes. It affects millions of people worldwide and its prevalence continues to rise as the incidence of diabetes increases. Characterized by damage to the kidney's filtering system, diabetic nephropathy can lead to Chronic Kidney Disease (CKD) and, in severe cases, kidney failure. This article will delve into the causes, risk factors, stages, diagnosis, treatment and preventive strategies of diabetic nephropathy. Diabetic nephropathy is primarily caused by prolonged hyperglycemia elevated blood sugar levels leading to structural and functional changes in the kidneys. The kidneys have tiny filtering units called glomeruli, which are responsible for filtering waste products and excess fluids from the blood. High blood sugar levels over time can damage these glomeruli, impairing their ability to function properly. Additionally, diabetes can cause blood vessels in the kidneys to stiffen, restricting blood flow and further contributing to kidney damage. The process begins with hyperglycemia-induced oxidative stress, which triggers inflammation and fibrosis within the glomeruli. Over time, this leads to glomerular basement membrane thickening and mesangial expansion, hallmark signs of diabetic nephropathy. If untreated, the condition can progress to proteinuria, where excess proteins like albumin leak into the urine, a sign of worsening kidney function.

## Stages of diabetic nephropathy

Diabetic nephropathy progresses through five stages, each marked by worsening kidney function. In the first stage, hyperfiltration occurs, where the kidneys work harder than normal without any visible symptoms. Early detection is possible only through specialized screening tests, where a small amount of albumin a type of protein can be detected in the urine, signaling early kidney damage. In the second stage, increased levels of albumin appear in the urine (microalbuminuria), but kidney function remains relatively preserved. As the disease progresses to stage three, albumin levels in the urine rise significantly (macroalbuminuria) and patients may experience swelling (edema), fatigue and high blood pressure. Kidney function starts to decline more rapidly at this point. Stage four

marks the onset of severe chronic kidney disease, where kidney function continues to deteriorate. Without appropriate intervention, stage five results in kidney failure, where dialysis or kidney transplantation becomes necessary to sustain life. Early detection and proper management of diabetes can help delay or prevent the progression of diabetic nephropathy, highlighting the importance of regular screening for patients with diabetes.

## Oral hypoglycemics

Managing diabetic nephropathy focuses on controlling blood sugar levels, blood pressure and reducing the risk of further kidney damage. Early intervention can slow or even halt disease progression. Maintaining optimal blood sugar levels is the cornerstone of managing diabetic nephropathy. Medications such as insulin, oral hypoglycemics and newer agents like Sodium-Glucose Co-Transporter-2 (SGLT2) inhibitors can help achieve better glycemic control. Angiotensin-Converting Enzyme (ACE) inhibitors and Angiotensin II Receptor Blockers (ARBs) are commonly used to lower blood pressure and protect the kidneys from further damage. Target blood pressure levels should be below 130/80 mmHg. Dietary modifications, including reducing salt intake, limiting protein consumption and maintaining a healthy weight, can help manage both diabetes and kidney disease. Smoking cessation is strongly advised. Controlling cholesterol levels, avoiding nephrotoxic medications and treating any underlying cardiovascular issues are essential to improving kidney outcomes. In the advanced stages of diabetic nephropathy, when kidney function has declined significantly, dialysis or kidney transplantation may be required. Prevention strategies for diabetic nephropathy are centered around maintaining optimal control of diabetes and associated risk factors. Regular monitoring of kidney function, blood pressure and blood sugar levels is critical in reducing the risk of progression to CKD or ESRD. Lifestyle modifications, including a healthy diet, regular physical activity and avoiding smoking, play a pivotal role in prevention. Additionally, medications such as SGLT2 inhibitors and Glucagon-Like Peptide-1 (GLP-1) receptor agonists have shown promise in reducing the risk of diabetic nephropathy progression. Early and aggressive treatment of hypertension and dyslipidemia further helps protect kidney function.