

# Glomerulonephritis: Types, Diagnosis and Treatment Strategies

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**Received date:** May 29, 2024, Manuscript No. IPMCR-24-19377; **Editor assigned date:** May 31, 2024, PreQC No. IPMCR-24-19377 (PQ); **Reviewed date:** June 14, 2024, QC No. IPMCR-24-19377; **Revised date:** June 21, 2024, Manuscript No. IPMCR-24-19377 (R); **Published date:** June 28, 2024, DOI: 10.36648/2471-299X.10.3.54

**Citation:** Guo S (2024) Glomerulonephritis: Types, Diagnosis and Treatment Strategies. Med Clin Rev Vol.10 No.3: 54.

## Description

Glomerulonephritis (GN) encompasses a diverse group of kidney diseases characterized by inflammation of the glomeruli, the kidney's essential filtering units responsible for removing waste and excess fluids from the blood to produce urine. This condition affects individuals across all age groups and exhibits varying degrees of severity and clinical presentations. Glomerulonephritis is classified into different types based on underlying causes and specific pathological features. Acute Glomerulonephritis typically manifests suddenly and is commonly associated with infections, such as streptococcal infections (post-infectious GN), as well as systemic diseases, autoimmune disorders, or exposure to certain medications or toxins. Chronic Glomerulonephritis develops gradually over time and may stem from recurrent episodes of acute GN, systemic illnesses like diabetes or lupus, genetic factors, or idiopathic origins (unknown causes). IgA Nephropathy, also known as Berger's Disease, ranks among the most prevalent forms of glomerulonephritis worldwide. It occurs when abnormal deposits of the antibody immunoglobulin A (IgA) accumulate within the glomeruli, leading to chronic inflammation and subsequent kidney damage over time.

## Membranous Nephropathy

Membranous Nephropathy is characterized by the thickening of the glomerular basement membrane due to deposits of immune complexes, gradually impairing kidney function. It can occur as a primary (idiopathic) condition or secondary to systemic disorders such as lupus or hepatitis B. Membrano Proliferative Glomerulonephritis (MPGN) involves structural changes in the glomeruli, resulting in thickening of the glomerular basement membrane and proliferation of cells within these units. It is classified into Type I, Type II (dense deposit disease), and Type III based on specific pathological features. Minimal Change Disease primarily affects children and is identified by minimal changes visible under a microscope. It commonly presents with nephrotic syndrome, marked by significant proteinuria (protein in urine), hypoalbuminemia (low blood albumin levels), edema (swelling) and hyperlipidemia

(elevated blood lipids). Clinically, glomerulonephritis can manifest with various symptoms, including hematuria (blood in urine) that can be microscopic or grossly visible and proteinuria, particularly prominent in nephrotic syndrome. Diagnosing glomerulonephritis involves a comprehensive assessment comprising medical history to identify symptoms, infections, medications, and family history of kidney disease. Physical examination checks for signs like fluid overload (edema) and hypertension. Laboratory tests evaluate kidney function using measures such as serum creatinine, Blood Urea Nitrogen (BUN), estimated Glomerular Filtration Rate (eGFR), and urinalysis to detect abnormalities like hematuria and proteinuria.

## Medications

Treatment of glomerulonephritis involves addressing underlying causes such as infections, managing systemic diseases like diabetes or hypertension, and discontinuing medications that may harm the kidneys. Medications are tailored to the specific type of glomerulonephritis and may include immunosuppressants such as corticosteroids or cyclophosphamide, Angiotensin-Converting Enzyme (ACE) inhibitors or Angiotensin II Receptor Blockers (ARBs) to control blood pressure and reduce proteinuria, and diuretics to manage fluid retention. Dietary adjustments, like restricting salt and protein intake, help alleviate edema and lessen kidney workload. Regular monitoring of kidney function, blood pressure, and urine protein levels is essential for managing glomerulonephritis effectively. The prognosis varies widely depending on the type, severity, and response to treatment. Acute forms can resolve completely with appropriate therapy, while chronic conditions or those progressing to End-Stage Renal Disease (ESRD) may necessitate lifelong management or renal replacement therapy (dialysis or transplantation). Glomerulonephritis is associated with complications such as Chronic Kidney Disease (CKD), characterized by ongoing decline in kidney function, and ESRD, where kidney function is severely impaired, requiring dialysis or transplantation. Patients also face increased risks of cardiovascular disease due to hypertension and fluid overload, as well as susceptibility to infections, particularly when receiving immunosuppressive treatments.