

Effects of Kidney Disorders on Human Health

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DESCRIPTION

Kidneys are vital organs responsible for filtering waste products and excess fluids from the blood, regulating electrolyte balance and maintaining blood pressure. When kidney function is impaired due to various disorders, it can have profound effects on overall human health.

Kidney disorders surround a wide range of conditions that affect the structure and function of the kidneys. These disorders can broadly be categorized into acute and chronic conditions. Acute Kidney Injury (AKI) is a sudden and temporary loss of kidney function, often due to conditions like dehydration, severe infection or medication toxicity, whereas Chronic Kidney Disease (CKD) is a persistent kidney damage or decreased kidney function over time, often caused by conditions like diabetes, hypertension, glomerulonephritis or polycystic kidney disease.

Systemic impact of kidney disorders

The kidneys maintain homeostasis within the body. When kidney function is compromised, several systemic consequences can occur which are as follows.

Fluid and electrolyte imbalance: Impaired kidney function can lead to fluid retention (edema) and electrolyte imbalances, such as hyperkalemia (high potassium levels) or metabolic acidosis.

Cardiovascular complications: CKD is associated with an increased risk of cardiovascular disease, including hypertension, heart failure and atherosclerosis. Kidney dysfunction contributes to abnormalities in blood pressure regulation and vascular health.

Bone and mineral disorders: CKD disrupts the balance of calcium and phosphorus metabolism, leading to bone diseases like osteoporosis or osteomalacia.

Anemia: Reduced production of erythropoietin (a hormone produced by the kidneys) in CKD can lead to anemia, resulting in fatigue and reduced exercise tolerance.

Immune dysfunction: Kidney disorders can impair immune function, increasing susceptibility to infections and delaying wound healing.

Diagnostic challenges

Diagnosing kidney disorders requires a systematic approach, including;

Laboratory tests: Blood tests to assess kidney function (e.g., serum creatinine, blood urea nitrogen), electrolyte levels and markers of kidney damage (e.g., urinary albumin-to-creatinine ratio).

Imaging studies: Ultrasound, Computed Tomography (CT) scan or Magnetic Resonance Imaging (MRI) to evaluate kidney size, shape and structure, as well as detect abnormalities like kidney stones or cysts.

Kidney biopsy: In certain cases, a biopsy may be performed to examine kidney tissue under a microscope, aiding in the diagnosis of specific kidney diseases.

Treatment

The management of kidney disorders aims to slow disease progression, alleviate symptoms and prevent complications.

Medications: Depending on the underlying cause, medications may be prescribed to control blood pressure (e.g., Angiotensin-Converting Enzyme (ACE) inhibitors or Angiotensin Receptor Blockers (ARBs)), manage diabetes, reduce proteinuria or treat specific kidney diseases (e.g., immunosuppressive agents for glomerulonephritis).

Dietary modifications: Restricting salt, potassium and phosphorus intake may be necessary to manage fluid balance and electrolyte levels in patients with kidney disorders.

Dialysis: In advanced CKD or AKI cases where kidney function is severely impaired, dialysis (hemodialysis or peritoneal dialysis) may be required to remove waste products and excess fluids from the blood.

Kidney transplantation: For patients with end-stage kidney disease, kidney transplantation offers the best long-term outcome, providing a new kidney to replace the failed ones.

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Proactive management and prevention

Preventing kidney disorders involves addressing modifiable risk factors such as controlling diabetes, hypertension and other chronic diseases can help prevent or slow the progression of kidney disease. Adopting a balanced diet, maintaining a healthy weight, exercising regularly and avoiding excessive alcohol consumption can reduce the risk of kidney disorders. Individuals at risk for kidney disease should undergo regular health screenings, including blood pressure checks and kidney function tests, to detect early signs of kidney dysfunction.

CONCLUSION

In conclusion, fluid and electrolyte imbalances, cardiovascular complications like hypertension and heart disease, bone and

mineral disorders, anemia and compromised immune function are all common manifestations for kidney disorders. These conditions not only diminish quality of life but also increase the risk of severe complications and mortality.

Medications along with dietary modifications and dialysis when necessary, are followed. Kidney transplantation offers the most effective long-term solution. Managing chronic conditions like diabetes and hypertension, adopting a healthy lifestyle and regular health screenings are essential in preventing kidney disease or delaying its progression.