PATHOPHYSIOLOGY OF THE KIDNEYS AND KIDNEY DISEASES

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Abstract: The kidneys are vital organs responsible for maintaining homeostasis in the human body. They play a crucial role in blood filtration, waste excretion, electrolyte and fluid balance, acid-base regulation, and blood pressure control. Pathophysiological processes affecting the kidneys can lead to various diseases, including acute and chronic kidney failure, nephritis, nephrotic syndrome, kidney stones, and other disorders.

Keywords: kidneys, kidney pathophysiology, renal failure, glomerulonephritis, pyelonephritis, nephrotic syndrome, kidney stones, dialysis, kidney transplantation, chronic kidney disease, electrolyte balance, hypertension, renal anemia, osteodystrophy, renal infections

This article explores the primary mechanisms underlying kidney pathophysiology, their impact on the body, and modern diagnostic and treatment approaches. Special attention is given to chronic kidney disease (CKD), its progression, and associated complications such as hypertension, anemia, osteodystrophy, and cardiovascular disorders. The article also examines current therapeutic strategies, including pharmacological treatment, dialysis, and kidney transplantation.

Materials and Methods: This study is based on a review of scientific literature, clinical studies, and nephrology guidelines. The mechanisms of kidney disease pathogenesis, diagnostic methods, and modern treatment approaches were analyzed. A comparative analysis of different therapeutic strategies, including conservative management, dialysis, and surgical interventions, was conducted.

Conclusion: Kidney diseases represent a significant medical challenge, requiring a comprehensive approach to diagnosis and treatment. Understanding the pathophysiological mechanisms of kidney dysfunction allows for the development of effective treatment and prevention strategies. Early diagnosis is critical, as timely intervention can prevent the progression of chronic kidney disease and severe complications. Future research should focus on improving treatment methods, advancing kidney transplantation techniques, and identifying new biomarkers for early diagnosis of kidney pathology.

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