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RISK FACTORS AND PREVENTIVE APPROACHES IN THE MANAGEMENT OF CHRONIC PYELONEPHRITIS

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Abstract: Chronic pyelonephritis is a persistent inflammatory kidney disease associated with recurrent urinary tract infections and progressive impairment of renal function. This study evaluated the clinical characteristics, risk factors, and importance of early diagnosis in patients with chronic pyelonephritis using clinical and laboratory findings. Particular attention was given to demographic features, microbial etiology, and preventive approaches aimed at reducing disease progression and complications. Women were affected more frequently than men, while delayed diagnosis increased the likelihood of recurrent infection and chronic kidney damage. Early identification of risk factors and timely preventive measures may improve long-term renal outcomes and reduce the burden of chronic pyelonephritis.

Keywords: chronic pyelonephritis; urinary tract infection; early diagnosis; prevention; renal function.

ФАКТОРЫ РИСКА И ПРОФИЛАКТИЧЕСКИЕ ПОДХОДЫ В ВЕДЕНИИ ПАЦИЕНТОВ С ХРОНИЧЕСКИМ ПИЕЛОНЕФРИТОМ

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Аннотация: Хронический пиелонефрит представляет собой длительное воспалительное заболевание почек, сопровождающееся рецидивирующими инфекциями мочевыводящих путей и постепенным ухудшением функции почек. В исследовании проведена оценка клинических особенностей, факторов риска и значения ранней диагностики хронического пиелонефрита на основании клинических и лабораторных данных. Особое внимание

уделено демографическим характеристикам, микробной этиологии и профилактическим мероприятиям, направленным на снижение риска прогрессирования заболевания и развития осложнений. Заболевание значительно чаще выявлялось у женщин, а поздняя диагностика повышала вероятность рецидивов инфекции и хронического поражения почек. Своевременное выявление факторов риска и проведение профилактических мероприятий способствуют улучшению долгосрочного прогноза и сохранению функции почек у пациентов с хроническим пиелонефритом.

Ключевые слова: хронический пиелонефрит; инфекция мочевыводящих путей; ранняя диагностика; профилактика; функция почек.

Introduction: Chronic pyelonephritis is a common infectious and inflammatory disease of the renal parenchyma and collecting system that remains an important cause of chronic kidney damage worldwide. The disease usually develops after recurrent urinary tract infections and may progress gradually with minimal clinical manifestations, delaying diagnosis and treatment. Persistent inflammation contributes to renal scarring, deterioration of tubular function, arterial hypertension, and, in advanced cases, chronic kidney disease. Women are affected considerably more often than men because of anatomical and physiological characteristics that facilitate ascending urinary tract infection. Early recognition of clinical symptoms together with appropriate laboratory and imaging investigations is essential for preventing irreversible renal injury. Routine urinalysis, urine culture, biochemical assessment of renal function, and ultrasonography remain the principal diagnostic tools for identifying chronic pyelonephritis at an early stage. Identification of modifiable risk factors, including urinary tract obstruction, diabetes mellitus, recurrent cystitis, and impaired urinary drainage, also plays an important role in disease prevention. Comprehensive management combining timely diagnosis, adequate antimicrobial therapy, correction of predisposing conditions, and long-term follow-up may reduce disease recurrence, preserve renal function, and improve overall patient prognosis.

Aim of the study: To evaluate the clinical characteristics, epidemiological features, and diagnostic findings of chronic pyelonephritis and to determine the importance of early diagnosis and preventive measures for reducing disease progression and renal complications.

Materials and methods. A retrospective observational study was performed using the medical records of 41 patients diagnosed with chronic pyelonephritis and treated in healthcare institutions in Tashkent. Participants were 20–70 years of age, with a mean age of 47 ± 0.8 years. Diagnosis was established according to clinical manifestations, laboratory investigations, and renal ultrasonography findings. Clinical assessment included analysis of medical history, urinary symptoms, recurrent infections, and associated comorbidities. Laboratory evaluation consisted of complete urinalysis, urine examination according to the Nechiporenko method, urine culture with antimicrobial susceptibility testing, and biochemical blood analysis including serum creatinine, urea, glucose, and total protein concentrations. Radiological investigations were performed when clinically indicated to identify structural abnormalities or urinary tract obstruction. Patients with acute kidney injury, severe chronic kidney disease, active malignant diseases, or incomplete clinical records were excluded from the study to ensure the reliability of the obtained results. Clinical severity was evaluated according to the frequency of disease exacerbations, laboratory indicators of urinary tract infection, and ultrasonographic findings of renal involvement. Microbiological culture results were used to identify the causative pathogens and determine their susceptibility to antibacterial agents before treatment selection. Follow-up data were analyzed to evaluate the recurrence of urinary tract infections and the effectiveness of therapeutic and preventive interventions. All collected clinical and laboratory information was anonymized before statistical processing to maintain patient confidentiality. The study protocol complied with accepted ethical principles for biomedical research and was conducted in accordance with institutional clinical practice requirements. Demographic characteristics, age distribution, and sex-related differences were analyzed. Statistical evaluation included descriptive

analysis of quantitative and qualitative variables. The relationship between demographic characteristics and disease occurrence was assessed to identify the groups at greatest risk for chronic pyelonephritis and its complications.

Results. Analysis of the collected data demonstrated a marked predominance of female patients with chronic pyelonephritis. The male-to-female ratio was 1:4, indicating a significantly higher prevalence among women. Among the evaluated patients, 17 (19.74%) were men with a mean age of 44.5 ± 24 years, whereas 29 (80.26%) were women with a mean age of 51.2 ± 32 years. The highest disease frequency was observed in middle-aged and older individuals, suggesting that increasing age contributes to disease occurrence and progression. Clinical records showed that recurrent urinary tract infection represented the principal predisposing factor for chronic pyelonephritis. Laboratory examination frequently demonstrated leukocyturia and bacteriuria, while urine culture enabled identification of the causative microorganisms and appropriate antimicrobial selection. Ultrasonography confirmed chronic inflammatory renal changes in most patients. Epidemiological analysis indicated that delayed diagnosis and persistent urinary infection increased the probability of recurrent exacerbations and progressive renal impairment. The obtained findings emphasize the importance of regular clinical monitoring, prompt microbiological investigation, and early initiation of evidence-based treatment to prevent chronic kidney damage and improve long-term clinical outcomes in patients with chronic pyelonephritis.

Conclusions: Chronic pyelonephritis remains one of the leading inflammatory diseases of the urinary system and predominantly affects women and older adults. Early diagnosis based on clinical assessment, laboratory investigation, urine culture, and renal ultrasonography enables timely treatment and reduces the risk of irreversible renal damage. Identification of predisposing factors and appropriate preventive measures, including management of urinary tract obstruction, recurrent infection, and metabolic disorders, are essential for limiting disease progression. Comprehensive long-term follow-up and patient education may improve renal outcomes, decrease recurrence rates, and preserve kidney function.

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