

CURRENT TRENDS IN UROLITHIASIS EPIDEMIOLOGY

Shadmanov M.A., Sadikova D.I., Sayfetdinov S.I.
Andijan State Medical Institute

Standardizing methods for collecting and interpreting epidemiological data allows for a more objective determination of the incidence, monitoring of growth trends, and identification of regional characteristics. Conducting large-scale, standardized studies increases the reliability of statistical indicators, creates a unified information base, and contributes to the development of effective programs for the prevention, diagnosis, and treatment of urolithiasis.

Keywords: urolithiasis, etiology, incidence, research, diagnosis, treatment, prevention.

АКТУАЛЬНЫЕ ДАННЫЕ И ТЕНДЕНЦИИ МОЧЕКАМЕННОЙ БОЛЕЗНИ

Шадманов М.А., Садикова Д.И., Сайфетдинов С.И.
Анджанский государственный медицинский институт

Стандартизация методов сбора и интерпретации эпидемиологических данных позволяет более объективно определять уровень заболеваемости, отслеживать тенденции её роста и выявлять региональные особенности. Проведение масштабных стандартизированных исследований повышает надёжность статистических показателей, создаёт единую информационную базу и способствует разработке эффективных программ профилактики, диагностики и лечения мочекаменной болезни.

Ключевые слова: мочекаменная болезнь, этиология, частота, исследования, диагностика, лечение, профилактика.

Introduction. According to international epidemiological studies, the prevalence of urolithiasis (urinary stone disease, USD) in the general population ranges from 5% to 15%. Data from multiple authors [1, 2, 4, 6, 8, 17] indicate a significant increase in incidence over the past decades, making USD a pressing medical and public health concern.

The highest prevalence is observed in industrialized countries, which is influenced by several factors, including poor dietary habits, excessive consumption of animal products and fast food, insufficient fluid intake, sedentary lifestyle, chronic stress, and climate change [11, 14, 15, 18].

The growing incidence of USD, particularly among individuals of working age, frequent recurrence, risk of severe complications, and the availability of multiple treatment options, underscores the need to explore novel approaches for organizing medical care. The need for individualized assessment of stone formation mechanisms further complicates preventive measures and reduces their overall effectiveness.

Objective. This study aims to retrospectively analyze literature sources on the epidemiology of urolithiasis, considering current trends in its prevalence.

Results. Analysis of the literature demonstrates substantial regional variation in the prevalence of USD. Differences are partly explained by objective factors, including climate, geographic conditions, ecological status, socioeconomic level, and ethnocultural characteristics [8, 9], as well as methodological discrepancies such as data quality, lack of uniform diagnostic criteria, and absence of screening programs, which can lead to underreporting of cases.

Certain geographic zones are characterized by particularly high prevalence, including hot and arid regions, as well as areas with sharply continental or arctic climates. The highest incidence is reported in northern Australia, southern parts of North America, eastern and western coasts of South America, Asia Minor, northeastern Africa, and southern and eastern regions of Asia [11, 12, 14, 18].

Several studies [6, 11, 14, 16] indicate a male predominance among USD patients (see Figure 1), which is believed to result from higher uric acid secretion, lower fluid intake, protein-rich diets, and occupational risk factors. Retrospective literature review also shows that the highest incidence occurs in individuals around 40 years old, i.e., the most productive age group [1, 2, 5, 12, 14, 15], consistent with the peak of metabolic activity.

Age is a significant determinant of susceptibility to USD. The highest prevalence is observed among people aged 30–55 years, influenced by metabolic activity, diet, physical activity, and occupational hazards [3, 6, 10, 17]. Among patients older than 60, the incidence of first-time USD decreases, while recurrence rates and risk of complicated disease increase due to chronic metabolic disturbances and coexisting somatic pathologies [4, 9, 12, 17].

Over the past decades, interest in modern approaches to treating USD has risen, coinciding with the adoption of technologies such as extracorporeal lithotripsy, nephroscopy, ureteroscopy, and laparoscopic interventions. Expansion of instrumental and minimally invasive surgical options has significantly improved treatment efficacy, but also requires urologists to select optimal strategies based on individual patient characteristics [7, 9, 10, 11, 13].

Despite the introduction of advanced methods for stone fragmentation and removal, the incidence of USD continues to rise [1, 8, 9, 10, 14, 18]. Lifestyle changes, globalization, technological development, and the widespread use of digital information have significantly affected human health patterns. Contributing factors include aging populations in developed countries [2, 3, 16], environmental deterioration, global warming [12, 14], accelerated life pace, disruption of circadian rhythms, dietary changes, altered sleep and rest patterns, reduced physical activity, and chronic stress. Collectively, these factors have doubled the prevalence of USD in the last two decades in countries such as the USA, Italy, Germany, Spain, and Japan [12, 13, 14, 15].

One of the most challenging aspects of USD management remains the high recurrence rate. Literature reports indicate that stones reappear within five years in 15–50% of cases, with 90–95% of recurrences occurring within the first year after stone removal [5, 14, 18]. Over longer follow-up periods, recurrence rates may reach 77% [5, 8, 11, 17].

The likelihood of stone recurrence is associated with persistent or intermittent metabolic disturbances promoting lithogenesis, as well as local pathological changes in the ureter–renal complex. These factors influence the chemical composition of the stones and the clinical course of the disease [2, 4, 10, 18]. Previous treatment outcomes also play a crucial role, depending largely on residual stones or fragments, urodynamic abnormalities, and coexisting chronic conditions.

Conclusion. Variability in patients' clinical and demographic characteristics, dietary habits, climate and environmental conditions, and the absence of unified diagnostic standards create significant discrepancies in assessing the true prevalence of USD. Standardizing methods for collecting and interpreting epidemiological data enables more accurate determination of disease burden, monitoring of trends, and identification of regional characteristics. Conducting large-scale, standardized studies improves the reliability of statistical indicators, establishes a unified information base, and supports the development of effective programs for prevention, diagnosis, and treatment of urolithiasis.

Literature

1. Assimos D., Krambeck A., Miller N. L. et al. Surgical Management of Stones: AUA/Endourological Society Guideline// J. Urol. -2023. -Vol. 209, No. 5. -P. 1103–1120
2. Boboev R.A., Sadikova D.I., Мамаризаев А.А. The litholytic therapy in patients with an undrained kidney//New day in medicine, -2021, N2(34), c.5-9
3. Khan S. R., Pearle M. S., Robertson W. G. et al. Kidney stones// Nat. Rev. Dis. Primers. - 2016. -Vol. 2. -P. 16008

4. Moe O. W. Kidney stones: pathophysiology and medical management// Lancet. -2019. - Vol. 393. -P. 234–246
5. Nishonov Sh., Rustamov U.M., Sadikova D.I. Course of ureterolithiasis in pregnant women// Экономика и социум, -2023, с. 310-312
6. Nishonov Sh., Sadikova D.I. Urolithiasis in extragenital pathology// Экономика и социум, -2023, с. 307-309
7. Sadikova D.I. et al Clinical symptoms of stones in pregnant women//ББК 51: 74.03 М34 22, 2023, 132
8. Sadikova D.I. et al Management of pregnant women with kidney stones// ББК 51: 74.03 М34 22, 2023, 129
9. Sadikova D.I. et al The method of treatment of ureterolithiasis by the method of contact lithotripsy//New day in medicine, -2021, N2(34), с.45-49
10. Trinchieri A. Epidemiology of urolithiasis: an update// Clin. Cases Miner. Bone Metab. -2020. -Vol. 17, No. 1. -P. 28–33
11. Türk C., Petřík A., Sarica K. et al. EAU Guidelines on Urolithiasis. — European Association of Urology, 2024. -67 p.
12. Hujamberdiev U., Sadikova D.I et al Questioned survey of the treatment of patients with urate lithiasis// New day in medicine, -2021, N2(34), с.50-55
13. Баженов С.М., Фомин В.В., Тюрин И.А. Климатические факторы и их роль в распространении мочекаменной болезни// Медицина труда и промышленная экология. - 2021. -№6. -С. 40-45
14. Зайцев А.В., Трусков А.А. Анализ факторов риска рецидивов мочекаменной болезни// Клиническая нефрология -2020. - №2. -С. 33-39
15. Каприн А. Д., Глыбочко П. В., Иванов В. В. Эпидемиологические аспекты мочекаменной болезни в Российской Федерации// Урология-2022. -№4. -С. 5-11
16. Лоран О. Б., Винаров А. З., Ситдыков А. А. Роль метаболических нарушений в развитии мочекаменной болезни// Экспериментальная и клиническая урология. -2021. - №1. -С. 28–34
17. Рустамов У.М., Шадманов М.А., Садикова Д.И. Выбор оперативных вмешательств при лечении больных коралловидным нефролитиазом и их осложнения// “Вестник НУУз”, -2023, с.116-120
18. Садикова Д.И., Косимхожиев М.И. Ретроспективный анализ литературных данных об инфекции мочевого тракта// Инфекция, иммунитет и фармакология, 2023, с.101-104