CAUSES OF UROLITHIASIS AND ITS PREVENTION

Otakulov Gayratzhon Olimzhonovich
Yakubov Abduvakhid
Central Asian Medical University.
Fergana, Uzbekistan.
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ABSTRACT

According to international data, the prevalence of urolithiasis ranges from 5% to 10% in Europe and Asia, depending on climate, nutrition, and genetic factors. In Uzbekistan, the prevalence of urolithiasis is estimated at 4–8%, and in the dry climate of the Fergana Valley, it is possibly higher due to the hot climate and inadequate hydration.

The relevance of this study lies in the need to identify the main causes of urolithiasis in residents, taking into account regional factors (climate, nutrition, lifestyle), and to develop appropriate preventive measures.

Introduction. Urolithiasis is one of the most common urological diseases worldwide. According to international data, the prevalence of urolithiasis ranges from 5% to 10% in Europe and Asia, depending on climate, diet, and genetic factors. In Uzbekistan, the prevalence of urolithiasis is estimated at 4–8%, and in the dry climate of the Fergana Valley, it is possibly higher due to the hot climate and inadequate hydration.

The lack of an adequate preventive strategy contributes to recurrent exacerbations and complications, leading to a decrease in patients' quality of life and an increased burden on the healthcare system.

The relevance of this study lies in the need to identify the main causes of urolithiasis in residents, taking into account regional factors (climate, diet, lifestyle) and to develop appropriate preventive measures.

Purpose of the study. To determine the causes of urolithiasis in the population of the Fergana Valley and propose recommendations for prevention.

Material and research methods. A prospective cohort study was conducted at the Fergana Urology Clinic.

400 patients, including 229 men and 171 women, aged 18–75 years, were examined. They were admitted to clinics in the Fergana Valley with newly diagnosed urolithiasis between 2022 and 2024.

The following study methods were used: ultrasound of the kidneys and urinary tract, symptom assessment, and risk factor analysis: climate, fluid intake, dietary habits, obesity (BMI), family history, metabolic disorders (hyperuricemia, hypercalcemia). Descriptive and correlational statistical methods were used, including the χ^2 test and the T-test, $p < 0.05$.

Results and discussion. A substantiation and comparison of ultrasound and IPSS data was conducted. Although the IPSS is classically used to assess lower urinary tract symptoms associated with prostate problems, in the context of the ICD, the scale was used to assess dysuric symptoms associated with stone migration into the urethra or bladder.

Patients with more severe dysuria (IPSS ≥20) were more likely to have stones ≥15 mm in size and concomitant infections. Correlation analysis revealed a moderate association between stone size and symptom severity according to the IPSS ($r = +0.49$, $p < 0.001$).

The study results allow us to identify risk factors for the development of urolithiasis in the Fergana Valley population:

1. Climate: a hot, dry climate promotes greater fluid loss, resulting in more concentrated urine—a favorable environment for salt crystallization;

2. Insufficient hydration: 79.5% of patients did not consume enough fluid, which is a leading risk factor;

3. Diet: high protein and salt intake increases the risk of stone formation, especially oxalate and urate stones;

4. Metabolic disorders: hyperuricemia and obesity contribute to stone formation.

A comparison of ultrasound and IPSS data shows that larger stones are more often accompanied by severe symptoms of dysuria and urinary tract infections. These results are consistent with regional observations and the literature on urolithiasis in dry climates.

Conclusions. The main causes of urolithiasis among the population of the Fergana Valley are inadequate hydration, dietary habits (high protein and salt intake), climatic conditions, and metabolic disorders. To reduce the prevalence of urolithiasis in the region, preventive measures aimed at dietary modification, increased fluid intake, and early metabolic diagnosis are needed..

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