

## МЕТАФИЛАКТИКА КАЛЬЦИЙ – ОКСАЛАТНОГО УРОЛИТИАЗА

Н.Ж.Эрматов.<sup>1</sup>, А.А.Гайбуллаев.<sup>2</sup>, С.С.Кариев.<sup>2</sup>, А.К.Дадабаев.<sup>2</sup>, Т.М.Бердибаев.<sup>2</sup>, А.К.Кучкаров.<sup>2</sup>

<sup>1</sup>Ташкентская медицинская академия,

<sup>2</sup>Центр развития профессиональной квалификации медицинских работников при Министерстве здравоохранения Республики Узбекистан.

Для цитирования: © Эрматов Н.Ж., Гайбуллаев А.А., Кариев С.С., Дадабаев А.К., Бердибаев Т.М., Кучкаров А.К. МЕТАФИЛАКТИКА КАЛЬЦИЙ – ОКСАЛАТНОГО УРОЛИТИАЗА. ЖКМП.-2024.-Т.4.-№4.-С

Поступила: 03.09.2024

Одобрена: 23.09.2024

Принята к печати: 03.10.2024

**Аннотация:** В данной статье представлены сведения о выделении кальция в суточной моче у 154 пациентов старше 18 лет. Все пациенты обследованы в 1-городской клинической больнице имени Ибн Сины города Ташкент. У всех больных диагностирован кальциево-оксалатный уролитиаз. Больным было назначено диетотерапия с целью метафилактики кальций-оксалатного уролитиаза, через месяц после самостоятельного отхождения камня или удаления его хирургическом путем. В течении 65 дней у больных измерялась выделение кальция в суточной моче в динамике.

**Ключевые слова:** мочекаменная болезнь, уролитиаз, кальций оксалат, метаболический синдром, метафилактика.

## KALTSIY OKSALATLI UROLITIAZ METAFILAKTIKASI

N.J.Ermatov.<sup>1</sup>, A.A.Gaybullayev.<sup>2</sup>, S.S.Kariyev.<sup>2</sup>, A.K.Dadabayev.<sup>2</sup>, T.M.Berdibayev.<sup>2</sup>, A.K.Kuchkarov.<sup>2</sup>

<sup>1</sup>Toshkent tibbiyot akademiyasi,

<sup>2</sup>O'zbekiston Respublikasi Sog'liqni saqlash vazirligi huzuridagi Tibbiyot xodimlarining kasbiy malakasini rivojlantirish markazi.

Izoh: © Ermatov N.J., Gaybullayev A.A., Kariyev S.S., Dadabayev A.K., Berdibayev T.M., Kuchkarov A.K.

KALTSIY OKSALATLI UROLITIAZ METAFILAKTIKASI.KPTJ.-2024-N.4.-№4-M

Qabul qilindi: 03.09.2024

Ko'rib chiqildi: 23.09.2024

Nashrga tayyorlandi: 03.10.2024

**Annotatsiya:** Ushbu maqolada Toshkent shahar Ibn Sino nomidagi 1-shahar klinik shifoxonasida kaltsiy oksalatli urolitiaz aniqlanqan 18 yoshdan katta bo'lgan 154 nafar bemorda siydik yo'llaridan tosh mustaqil tushgan yoki jarrohlik yo'li bilan olingandan so'ng bir oydan keyin 65 kun davomida metafylaktika maqsadida dietoterapiya qabul qilgan bemorlarning kunlik peshobida organizimdan kaltsiyning ajralish ko'rsatkichi haqida ma'lumotlar keltirilgan.

**Kalit so'zlar:** sidik tosh kasalligi, urolitiaz, kaltsiy oksalat, metabolik sindrom, metafylaktika.

## METAPHYLAXIS OF CALCIUM-OXALATE UROLITHIASIS.

Ermatov N.J.<sup>1</sup>, Gaybullaev A.A.<sup>2</sup>, Kariyev S.S.<sup>2</sup>, Dadabayev A.K.<sup>2</sup>, Berdibayev T.M.<sup>2</sup>, Kuchkarov A.K.<sup>2</sup>

<sup>1</sup>Tashkent Medical Academy,

<sup>2</sup>The Center for the Development of professional qualifications of medical workers under the Ministry of Health of the Republic of Uzbekistan.

For situation: © Ermatov N.J., Gaybullaev A.A., Kariyev S.S., Dadabayev A.K., Berdibayev T.M., Kuchkarov A.K.

METAPHYLAXIS OF CALCIUM-OXALATE UROLITHIASIS.JCPM.-2024.P.4.№4-A

Received: 03.09.2024

Revised: 23.09.2024

Accepted: 03.10.2024

**Annotation:** This article presents information on calcium excretion in daily urine in 154 patients over 18 years of age. All patients were examined at the 1st city clinical hospital named after Ibn Sina in Tashkent. All patients were diagnosed with calcium oxalate urolithiasis. The patients were prescribed diet therapy for the purpose of metaphylaxis of calcium oxalate urolithiasis, a month after the spontaneous passage of the stone or its surgical removal. Over the course of 65 days, the patients' calcium excretion in daily urine was measured over time.

**Keywords:** urinary stone disease, urolithiasis, calcium oxalate, metabolic syndrome, metaphylaxis.

**Introduction:** Urinary stone disease, nephrolithiasis or urolithiasis, is one of the most common urological diseases. Urolithiasis affects 3.5-9.6% of the world's population, and urinary stone disease among all urological diseases reaches 40%, most of the patients are of working age - from 30 to 60 years. The annual increase of the disease is from 0.5% to 5.3%. The lifetime risk of urinary stone disease recurrence is on average 5-15%, and within 10 years after surgery or spontaneous dissolution, the frequency of stone recurrence reaches 15-60%, and this depends on the type of STC and the primary treatment of the disease. depending on the size. [15]. In recent decades, great changes have occurred in the treatment of urolithiasis (STK), which is associated with the introduction of high-precision methods for the diagnosis of the disease and minimally invasive methods of urinary stone removal into urological practice [1-5]. Despite the application of modern treatment and diagnostic methods in the field of urology, the incidence of urolithiasis continues to increase in almost all countries of the world, and the medical and social importance of urinary stone disease has not decreased [6,7,8,9].

The most common urinary stone disease forms are calcium oxalate [10]. There are very positive results in conservative treatment of patients with calcium oxalate stones and prevention of their litholysis [11-14]. One of the characteristic features of the disease is the high rate of recurrence. After one year, about 10% of patients will have a repeat stone, after five years - 50%, and after 20 years - more than 75% of patients will have a repeat disease. At the same time, carrying out specific metaphylaxis measures reduces the risk of recurrence of the disease to 10-15% [16]. There is a direct relationship between the presence of metabolic syndrome and lithogenic disorders in the form of hypercalciuria, hyperoxaluria, hypocitraturia and decreased urine acidity ( $\text{pH} \leq 5.2$ ). Ekeruo W.O et al. Their research showed that hyperoxaluria occurs in 31% of patients with urolithiasis and obesity. [17]. In calcium-oxalate and calcium phosphate urolithiasis, the presence of crystalluria in general and specific disorders of substance exchange indicates the nature of the disease [18.19.20]. Despite the early detection of Urinary stone disease with the help of high-tech diagnostic methods, the emergence of pathogenetic types of conservative and phytotherapy, the recurrence of the disease is increasing in developed countries with minimally invasive surgical treatment methods. Based on the analysis of the litera-

ture, the role of metaphylaxis is important in order to reduce the probability of urinary stone disease recurrence. Adequate nutrition is important in preventing urinary stone disease recurrence, and there is very little research on dietary therapy for urolithiasis. In this regard, such clinical studies should be classified as required.

**Materials and methods:** The Center for the Development of Professional Qualifications of Medical Workers from January 2022 to December 2022 as a research object. 154 patients over 18 years of age who were treated with the diagnosis of calcium oxalate urolithiasis in the 1st city clinical hospital named after Ibn Sina, the base of the department of urology and andrology, were examined. Eligibility criteria: 18 years and older; patients diagnosed with urolithiasis with calcium calcification, who had stones removed from the urinary tract independently, or stones were removed from the urinary tract by a minimally invasive surgical method. Exclusion criteria: under the age of 18, with residual stones in the kidney and urinary tract, with urinary tract infection, with developmental defects of the urinary tract, chronic kidney disease (glomerulonephritis, chronic kidney disease), gastrointestinal patients with tract diseases, diabetes, gout, persistent arterial hypertension. Methods of general clinical examination: study of complaints, current medical history, collection of information about life history, objective examination, diuresis diaries. Instrumental methods: ultrasound, x-ray (interpretive, excretory urography, radioisotope renography and, if necessary, CT);

**Laboratory methods:** general and biochemical blood analysis, measurement of urine pH, studies of metabolic changes in urine (Ca, Ox), determination of crystalluria, study of the mineral composition of stones. Blood Ca was measured to rule out primary hyperparathyroidism (BGPT) before enrolling patients in the study. In case of hypercalcemia (serum Ca above 2.5 mmol/l), the concentration of inorganic phosphorus (Pi) and the content of parathyroid hormone in the blood are additionally checked. Patients with symptoms of hyperparathyroidism and high levels of parathyroid hormone were not included in this study. Urine calcium (Ca) was measured in biochemical analyzers using standard kits. 154 patients with uncomplicated calcium stone formation participated in the study.

Patients were divided into observation and control groups, 114 patients were included in the observation group, and 40 patients were included in the control group. The observation and control group included those who had undergone kidney puncture for the first time and again during their lifetime, stones were detected in the urinary system using Ultrasound diagnosis, multispiral computed tomography, calcium oxalite urolithiasis was detected by laboratory methods, stones were removed from the urinary tract independently or minimally invasively. patients who were at least 1 month after stone removal were included.

**Distribution of patients by age and sex.**

**Table 1 - control group.**

Age (in)	Male		A woman		Total	
	number	%	number	%	snumber	%
18-20	3	2,63%	2	1,75%	5	4,38%
21-29	7	6,14%	12	10,52%	19	16,67%
30-39	26	22,8%	13	11,4%	39	34,21%
40-49	10	8,77%	10	8,77%	20	17,54%
50-59	11	9,64%	8	7,01%	19	16,67%
60 older in age	10	8,77%	2	1,75%	12	10,52%
<b>Total</b>	<b>67</b>	<b>58,78%</b>	<b>47</b>	<b>41,22%</b>	<b>114</b>	<b>100,0</b>

**Table 2 - control group**

Age (in)	Male		A woman		Total	
	number	%	number	%	number	%
18-20	0	0%	1	2,5%	1	2,5%
21-29	5	12,5%	8	20%	13	32,5%
30-39	5	12,5%	2	5%	7	22,5%
40-49	6	15%	4	10%	10	25%
50-59	3	7,5%	2	5%	5	12,5%
60 older in age	4	10%	0	0%	4	10%
<b>Total</b>	<b>23</b>	<b>57,5%</b>	<b>17</b>	<b>42,5%</b>	<b>40</b>	<b>100,0</b>

*Calcium status in daily urine during diet therapy in patients with calcium oxalate type of lithogenesis.*

114 patients under observation were prescribed diet therapy for 65 days based on a menu developed on the basis of national dishes, in order to prevent the re-formation of urinary tract stones, before starting metaphylactic diet therapy in patients, after the stone has fallen independently, or after one month of minimally in-

vasive surgical treatment. 40 control patients were given a recommendation for calcium oxalate stones, which is included in the standard of diagnosis and treatment of urological diseases approved by the Ministry of Health. Calcium (Ca) is an important component of lithogenesis. According to the literature [21,22], the formation of calcium urinary stones can occur in hypercalciuria (>8.0 mmol/l 24 hours) and normocalciuria (<5.0 mmol/l 24 hours). Excretion of Ca in daily diuresis was studied in patients before prescribing diet therapy to both groups. Available data were subjected to statistical processing.

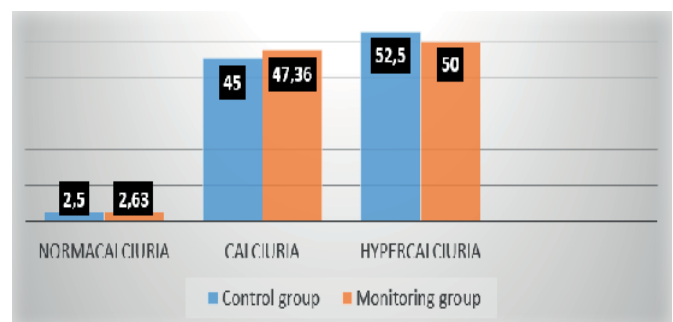
**Table 3. Indicator of KD Ca distribution to patients in mmol/liter.**

Daily indicator,mmol/l	M±m	< 5,0 (criterion)	5,0-8,0 (allowed allowance)	>8,0 (hypercalciuria)
total patients (154)	7,6 ± 0,5	4	72	78
Number of control patients (40)	7,55 ± 0,8*	1	18	21
Number of follow-up patients (114)	8,1 ± 0,5*	3	54	57

\*-p<0,05

The amount of daily diuresis Ca was checked in mmol/l before prescribing diet therapy to control and observation group patients. Control group: Normocalciuria <5.0 mmol/l 24 hours in 1 out of 40 patients (2.5%), calciuria 5.0-8.0 mmol/l in 18 out of 40 patients (45 hours), hypercalciuria >8.0 mmol /l 24 hours was determined in 21 of 40 patients (52.5%). Observation group: Normocalciuria <5.0 mmol/l 24 hours in 3 out of 144 patients (2.63%), calciuria 5.0-8.0 mmol/l 24 hours in 54 out of 114 patients (47.36%), hypercalciuria >8.0 mmol/l 24 hours was determined in 57 (50%).

**Figure 1: the difference in percent (%) of KD Ca excretion between groups before starting metaphylaxis is shown.**



In the patients of the control group, the amount of Ca in daily diuresis was determined based on the table on the 10-20-30-45-60 days after prescribing diet therapy based on the recommendation for calcium oxalate stones in the standard of diagnosis and treatment of urological diseases approved by the Ministry of Health of the Republic of Uzbekistan.

**Table-4. Daily diuresis Ca indicator of patients in the control group.**

Control days	n = 40 M ± m	< 5 mmol/l Number of patients (%)	5-8 mmol/l Number of patients (%)	> 8 mmol/l Number of patients (%)
10 day	6,9 ± 0,4	6 (15%)	19 (47,5%)	15 (37,5%)
20 day	6,9 ± 0,7	11 (27,5%)	20 (50%)	9 (22,5%)
30 day	6,1 ± 0,5	17 (42,5%)	19 (47,5%)	4 (10%)
45 day	6,1 ± 0,5	21 (52,5%)	18 (45%)	1 (2,5%)
60 day	6,0 ± 0,5	12 (30%)	22 (55%)	6 (15%)

After 10 days: Normocalciuria <5.0 mmol/l 24 hours in 6 out of 40 patients (15%), calciuria 5.0-8.0 mmol/l 24 hours in 19 out of 40 patients (47.5%), hypercalciuria > 8.0 mmol/l after 24 hours was determined in 15 of 40 patients (37.5%), and no significant difference was found between the pre-metaphylaxis indicator. After 20 days: Normocalciuria <5.0 mmol/l 24 hours in 11 of 40 patients (27.5%), calciuria 5.0-8.0 mmol/l 24 hours in 20 of 40 patients (50%), hypercalciuria > 8.0 mmol/l 24 hours was determined in 9 (22.5%).

After 30 days: Normocalciuria <5.0 mmol/l 24 hours in 17 of 40 patients (42.5%), calciuria 5.0-8.0 mmol/l 24 hours in 19 of 40 patients (47.5%), hypercalciuria > 8.0 mmol/l 24 hours was detected in 4 (10%). After 45 days: Normocalciuria <5.0 mmol/l 24 hours in 21 of 40 patients (52.5%), calciuria 5.0-8.0 mmol/l 24 hours in 18 of 40 patients (45%), hypercalciuria > 8.0 mmol/l in 24 hours was determined in 1 (2.5%).

After 60 days: Normocalciuria <5.0 mmol/L 24 hours in 12 of 40 patients (30%), calciuria 5.0-8.0 mmol/L 24 hours in 22 of 40 patients (55%), hypercalciuria > 8.0 mmol/l 24 hours was determined in 6 (15%) After 10 days: Normocalciuria <5.0 mmol/l 24 hours in 34 of 114 patients (29.8%), calciuria 5.0-8.0 mmol/l 24 hours in 54 of 114 patients (47.3%), hypercalciuria > 8.0 mmol/l at 24 hours was detected in 26 (22.8%), and no significant difference was detected between pre-metaphylactic indicators.

After 20 days: Normocalciuria <5.0 mmol/l 24 hours in 69 of 114 patients (60.5%), calciuria 5.0-8.0 mmol/l 24 hours in 38 of 114 patients (33.3%), hypercalciuria > 8.0 mmol/l 24 hours was determined in 7 (6.1%).

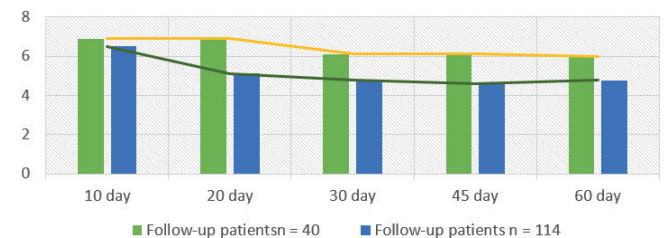
After 30 days: Normocalciuria <5.0 mmol/L 24 hours in 87 of 114 patients (76.3%), calciuria 5.0-8.0 mmol/L 24 hours in 23 of 114 patients (20.1%), hypercalciuria > 8.0 mmol/l 24 hours was determined in 4 (3.5%). After 45 days: Normocalciuria <5.0 mmol/l 24 hours in 102 of 114 patients (89.5%), calciuria 5.0-8.0 mmol/l 24 hours in 12 of 114 patients (10.5%), hypercalciuria > 8.0 mmol/l 24 hours undetectable.

**Table-5. Daily diuresis Ca indicator of patients in the observation group.**

Control days	n = 40 M ± m	< 5 mmol/l Number of patients (%)	5-8 mmol/l Number of patients (%)	> 8 mmol/l Number of patients (%)
10 day	6,5 ± 0,2	34 (29,8%)	54 (47,3%)	26 (22,8%)
20 day	5,12 ± 0,3	69 (60,5%)	38 (33,3%)	7 (6,1%)
30 day	4,8 ± 0,3	87 (76,3%)	23 (20,1%)	4 (3,5%)
45 day	4,6 ± 0,2	102 (89,5%)	12 (10,5%)	0
60 day	4,76 ± 0,16	99 (86,8%)	14 (12,3%)	1 (0,87%)

After 60 days: Normocalciuria <5.0 mmol/L 24 hours in 99 of 114 patients (86.8%), calciuria 5.0-8.0 mmol/L 24 hours in 14 of 114 patients (12.3%), hypercalciuria >8.0 mmol/l 24 hours was detected in 1 (0.87%).

**Figure 2: The average value of Ca in the daily diuresis in the dynamics between the control and observation groups during diet therapy is presented.**



In the control group of patients who received diet therapy based on a weekly menu prepared from ready-made meals developed for the purpose of metaphylaxis of calcium oxalate urinary stone disease, daily diuresis Ca in the dynamics of daily diuresis by 30 days revealed normocalciuria in 114 patients (76.3%) and the average Ca excretion was 4.8 + 0.3 mmol/l 24 hours, which means that the average daily diuresis Ca before diet therapy is 8.1 + 0.5, the difference is significant -p<0.05, daily diuresis Ca by 65 days 99 out of 114 patients (86.8%) were within the norm, average Ca excretion was 4.76 + 0.16 mmol/l 24 hours, normocalciuria by 65 days in the control group 12 out of 40 patients (30%) )

and averaged  $6.0 \pm 0.5$  mmol/l 24 hours. In the control group, 12.3% of daily diuresis calciuria, 55% of the control group, hypercalciuria was detected in 0.87% of the control group, 15% of the control group. The diet therapy developed for metaphylaxis of urolithiasis in patients with calcium oxalate urolithiasis can be used to control urinary calciuria from risk factors in patients and to reduce the recurrence of urolithiasis.

## REFERENCES.

1. Яненко Э.К., Меринов Д.С., Константинова О.В. Епишов В.А., Калиниченко Д.Н. Современные тенденции в эпидемиологии, диагностике и лечении мочекаменной болезни. Экспериментальная и клиническая урология 2012;(3): 19-24
2. Дутов В.В. Современные аспекты диагностики и лечения мочекаменной болезни у пациентов пожилого и старческого возраста. Русский медицинский журнал 2014;(29): 2100-2104
3. Niemann T, Kollmann T, Bongartz G. Diagnostic performance of low-dose CT for the detection of urolithiasis: a meta-analysis. *AJR Am J Roentgenol* 2008;191(2):396-401.
4. Beltrami P, Ruggera L, Guttilla A, Iannetti A, Zattoni F, Gigli F, et al. Endourological treatment of renal matrix stones. *Urol Int* 2014;93(4):394-8.
5. Berkman DS, Landman J, Gupta M. Treatment outcomes after endopyelotomy performed with or without simultaneous nephrolithotomy: 10-year experience. *J Endourol* 2009;23(9):1409-13.
6. Каприн А.Д., Аполихин О.И., Сивков А.В., Москалева Н.Г., Солнцева Т.В., Комарова В.А. Анализ уронефрологической заболеваемости и смертности в Российской Федерации за 2003-2013 гг. Экспериментальная и клиническая урология 2015;(2):4-12
7. Sánchez-Martin FM, Millán Rodríguez F, Esquena Fernández S, et al. Incidence and prevalence of published studies about urolithiasis in Spain. A review. *Actas Urol Esp* 2007;31(5):511-20.
8. Yasui T, Ando R, Okada A, Tozawa K, Iguchi M, Kohri K. Epidemiology of urolithiasis for improving clinical practice. *Hinyokika Kyo* 2012;58(12):697-701.
9. Stamatelou KK, Francis ME, Jones CA, Nyberg LM, Curhan GC. Time trends in reported prevalence of kidney stones in the United States: 1976-1994. *Kidney Int* 2003;63(5):1817-1823.
10. Türk C, Knoll T, Petrik A, Sarica K, Skolarikos A, Straub M, et al. Guidelines on Urolithiasis. European Association of Urology 2015. Available from: [http://uroweb.org/wp-content/uploads/22-Urolithiasis\\_LR\\_full.pdf](http://uroweb.org/wp-content/uploads/22-Urolithiasis_LR_full.pdf)
11. Колпаков И.С. Мочекаменная болезнь. Пособие для врачей. М., 2006, 21 С.
12. Глыбочко П.В., Аляев Ю.Г., Рапопорт Л.М., Цариченко Д.Г., Фролова Е.А. Современная консервативная (цитратная) терапия при уратных камнях мочеочечников. *Урология* 2014;(5):10-13.
13. El-Gamal O, El-Bendary M, Ragab M, Rasheed M. Role of combined use of potassium citrate and tamsulosin in the management of uric acid distal ureteral calculi. *Urol Res* 2012;40(3):219-24.
14. Mattle D, Hess B. Preventive treatment of nephrolithiasis with alkali citrate--a critical review. *Urol Res* 2005;33(2):73-79
15. Дзеранов Н.К., 2009; Голованов С.А. и соавт., 2010; Аполихин О.И. и соавт., 2013
16. Johri N, Cooper B, Robertson W, Choong S, Rickards D, Unwin R. An update and practical guide to renal stone management. // *Nephron Clin Pract.* 2010. Vol. 116, N3. P.159-171.
17. Ekeruo WO, Tan YH, Young MD. Metabolic risk factors and the impact of medical therapy on the management of nephrolithiasis in obese patients. // *J Urol.* 2004. Vol. 172. P.159-163
18. Тиктинский О.Л., Александров В.П. Мочекаменная болезнь. СПб.: Питер, 2000. 384с.
19. Hussain M, Rizvi SA, Askari H, Sultan G, Lal M, Ali B, Naqvi SA. Management of stone disease: 17 years experience of a stone clinic in a developing country. // *J Pak Med Assoc.* 2009.
20. Eisner BH, Goldfarb DS, Pareek G. Pharmacologic treatment of kidney stone disease. // *Urol Clin North Am.* 2013. Vol. 40, N 1. P. 21-30/
21. Диагностика и неселективная терапия кальциевого уролитиаза. (методические рекомендации Ташкент 2018) Гайбуллаев А.А., Кариев С.С.
22. EAU Guidelines. Edn presented at the EAU Annual Congress, Amsterdam, the Netherlands. 2020. ISBN 978-94-92671-07-3.