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## CRYSTALLURIA: TREATMENT AND PREVENTION

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**Summary:** The work highlights reasons, patogenesis, clinical signs of urate-oxalate crystalluria, author's technique of crystalluria treatment and prophylaxis.

**Key words:** crystalluria, 'Restructa pro injectione S'.

**Entry.** Disorders of urate-oxalate metabolism occur in 65-78% of patients with chronic kidney disease, may cause its progression [1-5]. In Ukraine, the incidence of crystalluria grows: 3.5 cases per 10 thousand of population. Transient uric acid hypercrystalluria (uraturia) often precedes the development of urolithiasis. Hyperoxalaturia almost always accompanies hyperoxalatemia. There exist exogenous and endogenous hyperoxalatemia. Exogenous hyperoxalatemia is of mainly alimentary origin (excessive consumption of foods containing oxalic acid and its salts), endogenous is caused by metabolic disorders. Synthesis of oxalic acid increases with deficiency of vitamins A, B, D, magnesium and vitamin B6 in particular, excessive consumption of foods containing vitamin C. Primary hyperoxalaturia is detected by early signs of oxalate crystalluria and renal colics. Without proper treatment of primary hyperoxalaturia, renal insufficiency is rapidly developed. Secondary hyperoxalaturia is caused by excess oxalate entered from food, and also gastrointestinal lesions (of intestinal, hepatobiliary system), increased administration of vitamin C, excessive fluid loss in spring and autumn, hypervitaminosis D. Due to the high prevalence, formation of nephrolithiasis, renal failure [1, 2], the search for new effective methods of preventive treatment is very important [2-5].

Treatment of urate-oxalate metabolism disorders includes dietary measures (limiting the number of purine-containing foods) and a course of drugs: allopurinol blocks the formation of uric acid, citrate mixture "Blemaren" shifts the pH of the urine into alkaline, magnesium preparation

normalizes electrolyte balance [3]. However, such therapy is not effective enough. In addition, the use of allopurinol may cause adverse reactions (nausea, stomach pain, headache etc). Acute gouty articular syndrome is discovered among patients receiving allopurinol and blemarenu. Recently, attention is drawn to antigomotoxic therapy, including drug "Restructa pro injectione S", which is aimed at normalizing uric acid metabolism, providing anti-inflammatory, analgesic and detoxification effects.

**The purpose of the work** is to examine the clinical efficiency of "Restructa pro injectione S" according to the clinical, laboratory and instrumental investigations, develop a methodology prevention of nephrolithiasis.

Antihomotoxic drug "Restructa pro injectione S", manufactured by Biologische Heilmittel Heel GmbH, Germany, consists of 18 components: 11 plants, 4 mineral, 3 animal. Due to its unique composition and homeopathic manufacturing technology, it normalizes the metabolism of uric acid, provides anti-inflammatory, immune correcting, detoxification, anesthetic, diuretic effects. The drug returns positive results in treatment of patients with urolithiasis; the components include autumn crocus (*Colchicum autumnale*), goldenrod (*Solidago virgaurea*), barberry (*Berberis vulgaris*), Bryonia cretica and others.

**Materiales and methods.** The study involved 36 patients with crystalluria, including 12 with oxalate, 9 with urate, 15 with mixed crystalluria (oxalate, urate). 26 people went into the main group and 10 - the group comparison. The control group included 10 healthy individuals. All patients received an increased amount of fluid (approximately 15 ml / kg every 6 hours) and were on a diet excluding products and foods containing ascorbic acid and oxalate (strong tea, coffee, chocolate, beets, asparagus, spinach, sorrel, parsley, rhubarb, tomatoes, currants, gooseberries, rose, extractive broth, limiting consumption of milk; meat was eaten only boiled and no more than twice a week. Depending on the version of the applied treatment, all examined patients with crystalluria were divided into 2 groups. The primary group of patients received 2.2 ml of the drug "Restructa pro injectione S" intramuscularly, during the 3-day course of 10-12 injections. The second, comparative group was treated in accordance with standards, without any antihomotoxic drug. Relative density of urine in both groups did not exceed 1005-1015 m., which contributed to leaching microlites and prevented pathological crystallization. Clinical picture of urinary tract infections (cystitis or pyelonephritis) was not observed in any case. Presence of crystalluria is

established on the basis of in-depth laboratory study examining blood and urine salt transport, data, excretory urography, ultrasound of the kidneys and bladder. Y.A. Pytel test was used as an additional method of diagnosis of urate nephrolithiasis the stability of the pH of the urine.

Antigomotoxic therapy was proven effective when the frequency and articular manifestations of the syndrome were reduced, urinary pH grew, the amount of uric acid in the blood and urine was lowered, and urine output was increased. Condition improvement was characterized by lack of protein, red blood cells, white blood cells or reduction of formed elements in the urine in 2 times; normalization of oxalates, urates, phosphates, Ca 2 + hour urine or reduce their excretion in the urine is 1.5 or more times, the lack of crystals or achievement unexpressed crystalluria (crystals 0-10 in sight) without enlarging crystals normalization or achievements expressed moderate changes in the colloidal state of the urine. Effect absence was defined by number of red blood cells and white blood cells increased or decreased less than 2 times, protein present; allocation of oxalates, urates, phosphates, Ca 2 + hour urine excretion increased or decreased less than 1.5 times; moderate crystalluria (10-30 crystals in sight) or large crystalluria (30-50 crystals in sight) achieved; crystalluria decreased less than 2 times, non-dynamical changes in colloidal state of urine significantly expressed.

Dynamic observation discovered that the drug "Restructa pro injectione S" combined with hipopurine diet returned a positive effect in all 26 patients with disorders of purine metabolism: immediately after the course excretion rates were significantly decreased at the expense of oxalates: from  $254,4 \pm 11,23$  to  $98,4 \pm 6,54$  mmol / day), urates: from  $4,87 \pm 0,91$  to  $2,87 \pm 1,04$  mmol / day, calcium ion level: up to  $2,52 \pm 0,36$  mmol / day, magnesium ion level: to  $3,58 \pm 0,74$  mmol / day; this ensured high urinary resistance to the formation of calcium oxalate, reduce of epitaxy and aggregation. Improvement the colloidal state of the urine, in particular by increasing the excretion of magnesium ions, contributed to elimination of crystalluria, urinary syndrome and restoration of urine pH (increased from  $5,3 \pm 0,5$  to  $6,1 \pm 0,8$ ,  $P < 0,05$  to  $6,3 \pm 0,8$  units). Decrease of uric acid in the study group was significantly higher than in control (as in blood -  $32 \pm 4\%$  ( $19 \pm 3\%$ ) in the urine -  $28 \pm 3\%$  (to  $18 \pm 2\%$ ),  $P < 0,05$  compared with data before treatment). 19 patients (73.03%) showed an increase in urine output after the second or third injection by 15-30% compared to the original ( $P < 0,05$ ), which is apparently the first sign of

detoxification recovery. None of the patients receiving the drug antihomotoxic "Restructa pro injectione S" on the background of allopurinol and blemaren observed acute gouty articular syndrome or negative dynamics of liver samples.

**Results and discussion:** Observations made 1 year after showed that, among 12 patients with oxaluria, two courses of "Restructa pro injectione S" (46.15%) normalized levels of oxalate in the urine of 9 patients (75%), and did not exceed the level of 30 mg / day ( $P < 0.05$  from baseline as the parameter, and the control group) in 3 others (25%). 9 patients (34.61%) of the primary group with isolated hyperuraturia, the latter remained after the treatment in 2 people (7.69%); increase of concentration of uric acid in the blood was observed in one patient (3.85%); among 15 patients (57.69%) of the primary group with mixed crystalluria, 12 patients (80%) had their uric acid levels decreased significantly, 1 patient (6.66%) had it remained slightly elevated; after three courses of antihomotoxic therapy with hypopurine diet, uric acid reached the upper limit of the norm ( $P < 0.05$  compared with baseline) in all patients. A year after the beginning of treatment, Urinary pH was maintained at  $6,1 \pm 0,3$  m. in 21 patients (80.76%),  $P < 0.05$  compared with the level of this parameter before treatment.

Author's technique aims to develop ways of preventing crystalluria, namely prescribing the drug "Restructa pro injectione S" depending on the experimentally found number of boundary accumulation of crystals in urine; antihomotoxic drug "Restructa pro injectione S" is prescribed differentially, depending on the concentration of uric acid in blood. If the concentration of uric acid is less than 0.5mmol/l, then monotherapy is prescribed at a dose of 2.2 ml of one intramuscular injection for 3 days. If the concentration is more than 0.5mmol/l, then "Restructa pro injectione S" is prescribed together with the basic treatment (allopurinol 100 mg twice daily, blemaren dose of 3-12 g three times a day, Mahnefar-B6 1 tablet twice a day). The drug "Restructa pro injectione S" provides effective preventive and therapeutic action aimed at preventing pathological crystallization, correction of existing disorders of urate-oxalate exchange by correcting the pH of urine and uric acid in the blood and urine, regulation of daily urine output, absence of undesirable side reactions.

Antihomotoxic treatment maintains positive dynamics of subjective and objective symptoms, namely accelerated involution of symptoms: rapid decrease in the intensity of joint pain, improvement of metabolism of

uric acid, stabilization of urinary pH within 6,2-7,0, disappearance of microhematuria and proteinuria. 2-3 courses are led per year, depending on the type of crystalluria: prevalence of urate crystalluria or mixed apply for 3 courses per year; oxaluria applies for 2 courses per year.

The research revealed that patients with crystalluria are successfully treated using the drug "Restructa pro injectione S", which is more uricodepressive than Blemaren, significantly reduces the excretion of oxalate with the urine, and acts against oxalate formation with significant urine alkalization. "Restructa pro injectione S" prevents acute articular syndrome during treatment with allopurinol; after the second or third injection, majority of patients experience diuretic effect of the drug, which lasts 1-2 weeks after discontinuation.

**Conclusion:** The drug "Restructa pro injectione S" normalizes metabolic processes which are the basis of dismetabolic nephropathy, normalizes metabolism of uric acid, provides anti-inflammatory, immune-correcting, detoxificative, anesthetic, diuretic effects, ensures prevention of crystalluria, accelerates involution of symptoms, provides high therapeutic efficacy without causing complications. Such tactics prevent the development of urolithiasis, traumatic surgery and frequent recurrence of stone formation.

#### REFERENCE

1. Andrew D. Rule. Chronic Kidney Disease in Kidney Stone Formers / Andrew D. Rule, Amy E. Krambeck, John C. Lieske // CJASN. – 2011. – vol. 6. – N 8. – P. 2069-2075.
2. Davalos M. Oxidative renal cell injury induced by calcium oxalate crystal and renoprotection with antioxidants: a possible role of oxidative stress in nephrolithiasis / M. Davalos, S. Konno, M. Eshghi, M. Choudhury // J. Endourol. – 2010. – Mar., Vol. 24 (3). – P. 339-345.
3. Moyseyenko V.O. Antihomotoxic treatment of chronic kidney disease // Actual problems of Nephrology: Scientific Papers (Issue 13) / Ed. T.D. Nykula / NMU. - Kyiv: Zadruga, 2007. - P.91-99.
4. Nykula T.D. Chronic renal failure. - K. Zadruga, 2001. - 516 p.
5. Stef Robijn. Hyperoxaluria: a gut-kidney axis? / Stef Robijn, Bernd Hoppe, Benjamin A. Vervaet, Patrick C. D'Haeselaer et al. // Kidney International. – 2011. - № 80. – P. 1146-1158.

#### РЕЗЮМЕ

**КРИСТАЛУРІЇ: ЛІКУВАННЯ І ПРОФІЛАКТИКА**

**Мойсеєнко В.О.**

(Київ)

**Мета:** вивчити клінічну ефективність "Реструкта про ін'єкціоне С" за клінічними, лабораторними та інструментальними дослідженнями, розробити методики профілактики нирковокам'яної хвороби. **Матеріали і методи:** У дослідження були залучені 36 пацієнтів з кристалурією, у тому числі 12 – з оксалатами, 9 – з urate, 15 – з мішаними кристалами. 26 осіб увійшли до основної групи і 10 – до групи порівняння. Група управління включено 10 здорових осіб. **Результати та обговорення:** Серед 12 пацієнтів з оксалурією два курси "Реструкта про ін'єкціоне С" (46.15%) нормалізовані рівні оксалатів у сечі 9 пацієнтів (75%). Із 9 пацієнтів (34,61%) первинної групи з ізольованою уратурією остання залишилася після лікування в 2 людей (7,69%); підвищення концентрації сечової кислоти в крові було відзначено в одного пацієнта (3,85%); серед 15 пацієнтів (57.69%) первинної групи змішаної кристалурії 12 хворих (80%) рівень сечової кислоти істотно скоротився, у 1 пацієнта (6,66%) залишився підвищений. **Висновок:** Препарат "Restructa pro injectione S" нормалізує обмінні процеси, які є основою дисметаболічної нефропатії, нормалізує обмін речовин, сечової кислоти, забезпечує протизапальний, імунокорегувальний, детоксикаційний, знеболювальний, сечогінний ефект, гарантує профілактику кристалурії, прискорює інволюцію симптомів, забезпечує високу терапевтичну ефективність не викликає ускладнень.

**Ключові слова:** кристалурія, Реструкта про ін'єкціоне С.

РЕЗЮМЕ

**КРИСТАЛЛУРИИ: ЛЕЧЕНИЕ И ПРОФИЛАКТИКА**

**Мойсеенко В.А.**

(Киев)

**Цель:** Исследовать клиническую эффективность «Реструкта про инекционе С» по клиническим, лабораторным и инструментальным

исследованиям, разработать методы для предотвращения мочекаменной болезни. **Материалы и методы:** в исследовании приняли участие 36 пациентов с кристаллурией, 26 человек – основная группа и 10 – группа сравнения. Контрольную группу составили 10 здоровых людей. **Результаты и обсуждение:** среди 12 больных с оксалурией после двух курсов «Реструкта про инъекционе С» (41%) нормализовался уровень оксалатов в моче у 9 больных (75%), среди 15 больных (73.75%) основной группы со смешанной кристаллурией 12 пациентов (80%) уровень мочевой кислоты значительно уменьшился, лишь у 1 пациента (6,66%) остается повышенным. **Вывод:** препарат «Реструкта про инъекционе С» нормализует метаболизм, который является основой дисметабоической нефропатии, нормализует обмен мочевой кислоты, оказывает противовоспалительный, иммунорегулирующий, детоксицирующий, противоболевой, мочегонный эффект, обеспечивает предотвращение кристаллурии, ускоряет инволюцию симптомов, обеспечивает высокую терапевтическую эффективность, не вызывает осложнений.

**Ключевые слова:** кристаллурия, Реструкта про инъекционе С.