

RESULTS OF USING OF TERPENS-BASED MEDICATION RENOTINEX IN PATIENTS WITH UROLITHIASIS AFTER EXTRACORPOREAL SHOCKWAVE LITHOTRIPSY

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⊗ In spite of high efficacy and safety of extracorporeal shockwave lithotripsy (ESWL), the question of reduction of this procedure complications risk continues to be relevant. In this study results of Renotinex prescription for patients with urolithiasis after ESWL are presented. Renotinex is a terpens-based drug and it has anti-inflammatory and lithokinetic properties. Inclusion of this medication in complex therapy leads to reduction of terms of stone fragments excretion, pain sensation reduction, bacteriuria frequency decrease.

⊗ **Keywords:** urolithiasis; extracorporeal shockwave lithotripsy; phytotherapy; Renotinex.

РЕЗУЛЬТАТЫ ПРИМЕНЕНИЯ ПРЕПАРАТА НА ОСНОВЕ ТЕРПЕНОВ РЕНОТИНЕКС У ПАЦИЕНТОВ С УРОЛИТИАЗОМ ПОСЛЕ ДИСТАНЦИОННОЙ УДАРНО-ВОЛНОВОЙ ЛИТОТРИПСИИ

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⊗ Несмотря на высокую эффективность и безопасность дистанционной ударно-волновой литотрипсии (ДУВЛТ), вопрос о снижении риска осложнений этой процедуры остается актуальным. В данной работе представлены результаты назначения препарата Ренотинекс больным уролитиазом после ДУВЛТ. Ренотинекс является лекарственным средством на основе терпенов и обладает противовоспалительными и литокинетическими свойствами. Включение препарата в комплексную терапию приводит к сокращению сроков отхождения фрагментов конкрементов, уменьшению болевых ощущений, снижению частоты бактериурии.

⊗ **Ключевые слова:** уролитиаз; дистанционная литотрипсия; фитотерапия; Ренотинекс.

INTRODUCTION

Extracorporeal shockwave lithotripsy (ESWL) has been used in urological practice since the last quarter of the 20th century. It promotes the disintegration of urinary tract calculi, including those localized in the pelvicalyceal system and the upper third of the ureter. This method of treatment is popular because of its low invasiveness. ESWL is considered as the method of choice for the treatment of patients with calculi of the renal pelvicalyceal system and ureters of 5 mm

to 15–20 mm in size at the current stage of urology development [1, 2]. Millions of such interventions have been performed till date. However, ESWL has a number of complications and the most common of them are as follows: hemorrhagic, infectious-inflammatory, and obstructive complications [3]. Reduction of the number of complications after ESWL has become one of the urgent tasks of clinical urology. Drug therapy plays an important role in improving ESWL results [4–6]. The use of terpene-based drug

has become widespread. They have varying degrees of expression of antiseptic, anti-inflammatory, and antispasmodic effect, but the lithokinetic effect of terpenes is the most significant for urology [7]. Drugs containing terpenes have been shown to be effective in the treatment and metaphylaxis of urolithiasis, including patients after ESWL [8, 9]. Renotinex (Polaris, Russia) is one of the new Russian drugs based on terpenes. It contains six types of terpenes (anethole, borneol, camphene, pinene, fenchone, and cineole) in a strictly defined quantitative ratio and alpha-tocopherol acetate (vitamin E). The drug has a nephroprotective effect in dysmetabolic nephropathies and urolithiasis, as well as anti-inflammatory and lithokinetic action [7]. The pharmacological properties of Renotinex enable it to administer in patients after ESWL to facilitate the excretion of calculi fragments.

The study aimed to compare and analyze the results of inclusion of Renotinex in the complex therapy of patients after ESWL with standard treatment in terms of the development of complications and the rate of excretion of calculi fragments.

MATERIALS AND METHODS

The study was conducted in the urology clinic of the Saratov V.I. Razumovsky State Medical University. The study included 60 patients aged 21–68 years (36 men and 24 women) with calculi of the pelvicalyceal system and the upper third of the ureter. All patients underwent electroconductive ESWL using a Sonolith i-sys apparatus (EDAP TMS, France).

The patients were distributed into two groups comparable by gender, age, and properties of the calculus disintegrated (see Table 1). Patients of group 1 (control) ($n = 30$) received standard post-operative therapy. Patients of group 2 ($n = 30$) were supplemented with the Russian terpene-based

drug Renotinex. Renotinex was administered orally at a dose of four capsules three times a day for 1 month.

All patients underwent multispiral computed tomography to determine the size, location, and density of calculi at the outpatient stage, before hospitalization. The study involved patients with calculi of medium density and small size (see the Table). Fragmentation of calculi <15 mm of average density increases the possibility of their disintegration during one ESWL session [2], which is necessary for objectification of the research results.

Treatment results were evaluated 30 days after the ESWL session. A complex of laboratory and instrumental studies was performed, which included urine and blood tests, ultrasound examination of the kidneys, plain urography, and computed tomography. Clinically significant bacteriuria was determined as per the recommendations of the European Association of Urology. The intensity of pain was assessed by using a visual analogue scale (VAS) during conversation with each patient.

The material obtained was statistically processed using the Statistica 10.0 program. The sample was preliminarily evaluated for compliance with the normal distribution. Descriptive statistics included the calculation of the arithmetic mean (M) and its error (m). Parametric Student's t -test was used to assess the significance of the differences. Differences were considered significant at $p < 0.05$. Pearson's chi-squared test (χ^2) was used to compare the incidence of complications and to identify significant bacteriuria in two groups.

RESULTS

Ultrasound examination of the urinary tract showed that all patients participating in the study had achieved complete fragmentation of calculi.

The main characteristics of patients of the 1st and 2nd groups, $M \pm m$ ($n = 60$)

Основные характеристики пациентов 1-й и 2-й групп, $M \pm m$ ($n = 60$)

Indicator	Group 1 ($n = 30$)	Group 2 ($n = 30$)
Average age, years	44 ± 1.3	43 ± 1.5
Gender composition (men/women)	19/11	17/13
Localization of calculus in the pyelocalyceal system, n (%)	26 (86.7%)	25 (83.3%)
Localization of calculus in the upper third of the ureter, n (%)	4 (13.3%)	5 (16.7%)
Average X-ray density of calculus, HU	927 ± 80	931 ± 77
Average diameter of calculus, mm	10 ± 1.8	11 ± 2.1

Note. HU – Hounsfield units.

There were no pronounced complications among the patients of group 2 who took the drug Renotinex. The complication rate in group 1 was 13.3%, as in four patients, the acute obstructive pyelonephritis with a steinstrasse was recorded in the postoperative period. These patients underwent endoscopic extraction of calculi fragments, and internal drainage of the upper urinary tract was performed using a ureteral catheter stent.

The average time period for the excretion of calculi fragments in patients of group 2 was 1.5 times shorter than patients of group 1, who received standard therapy, and amounted to 14.8 ± 1.2 and 22.6 ± 1.6 days, respectively, $p < 0.05$ (see Figure).

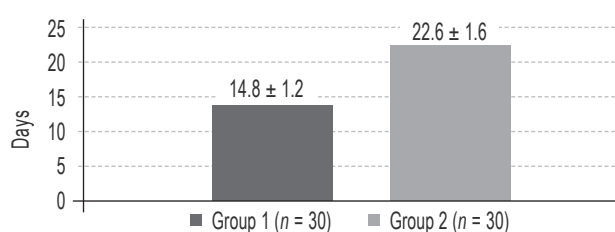
The excretion of calculi fragments in patients of group 2 was accompanied by less pronounced pain sensations compared with patients of group 1 (2.0 and 4.0 points, respectively, on the 10-point VAS, $p < 0.05$). Three (10%) patients of group 1 (control) and one (3.3%) patient of group 2 required additional administration of nonsteroidal anti-inflammatory drugs (diclofenac, ketorolac) because of the intensity of the pain syndrome during the excretion of the disintegrated calculus fragments. However, the differences do not reach the level of statistical significance ($p > 0.05$).

The Nechiporenko test was used to determine the average leukocyturia level and was found out to be 3340 in 1 mL in group 1, and it was 52% less (1750 in 1 mL) in group 2 ($p < 0.05$) (see Figure). The incidence of clinically significant bacteriuria in group 1 was 56.7% (17 cases of growth of *Enterococcus faecalis* and *Escherichia coli* colonies), and in group 2, it was 13.3% (4 cases of growth of *Staphylococcus spp.* and *E. coli*) ($p < 0.05$).

Patients who took Renotinex within their complex therapy noted a mild diuretic effect which did not cause significant inconvenience.

Thus, the results of the study showed the effectiveness of terpen-based drug Renotinex in the complex treatment of patients with urolithiasis after ESWL.

Terpenes can potentiate the effects of drugs with direct lithokinetic effect, used as part of complex therapy after ESWL [10]. This may be associated with an earlier complete excretion of calculi fragments in patients taking Renotinex. Possibly, Renotinex is characterized by its own expulsive action due to the affinity of terpene compounds in the drug for the smooth muscles of the ureters [11, 12]. The diuretic



The timing of the passage of calculus fragments after ESWL in patients of the 1st and 2nd groups, $p < 0.05$

Сроки отхождения фрагментов конкрементов после дистанционной ударно-волновой литотрипсии у пациентов 1-й и 2-й групп, $p < 0,05$

effect of the drug also contributes to a faster excretion of calculi fragments.

We consider it reasonable to study further the efficacy of Renotinex in patients with urolithiasis. For this purpose, this study, conducted on a limited sample size, is advisable to continue with the involvement of a larger number of patients.

CONCLUSION

A terpen-based drug Renotinex after extracorporeal lithotripsy is recommended for a faster and more painless excretion of fragments of destroyed calculi. It reduces the incidence of complications, facilitates the process of excretion of fragments of disintegrated calculus, and enables to reduce the severity of bacteriuria.

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