

## EFFECT OF EXPULSIVE DRUG THERAPY ON URETERAL STONE EVACUATION

D. Kh. Mirkhamidov

U. A. Xudoybergenov

S. S. Kasimov

Kh. B. Khudayberdiev

Ya. S. Nadjimitdinov

Tashkent Medical Academy

### ABSTRACT

To evaluate the possibilities of expulsive drug therapy in the treatment of patients with ureteral stones.

**Materials and Methods:** 50 patients with ureteral stones underwent standardized expiratory drug therapy.

**Results:** The use of standard expulsive drug therapy for the treatment of patients with ureteral stones provided independent removal of stones from the ureter in 40 (80%) patients.

**Conclusions:** Due to the high efficiency, the conservative approach should be considered as a treatment option for uncomplicated ureteral stones.

**Key words:** ureteral stones, drug therapy, treatment effectiveness

The high prevalence of urolithiasis (USD), which occurs in at least 5% of the population of industrialized countries, has been stimulating the search for effective mechanisms of metaphylaxis for many decades, the improvement of diagnostic methods, and the development of new surgical treatment technologies [3]. It is well known that men suffer from urolithiasis more often than women. Since the kidneys of men and women are anatomically identical, the role of sex hormones in the onset of kidney stones is obvious. Interestingly, the incidence of kidney stones before puberty is the same between men and women. In Uzbekistan, the prevalence of urolithiasis, depending on the region, is up to 8% [1,2]. The share of patients with ureteral stones accounts for 20 to 50% of all cases of urolithiasis disease[4]. Ureteral stones are an occlusive factor that increases the risk of serious complications of urolithiasis. Stones in the ureter, as a rule, cause pain, up to a severe attack of renal colic [6]. Modern therapies, such as extracorporeal extracorporeal shock wave lithotripsy (ESWL) and ureteroscopy, can resolve almost all cases of ureterolithiasis. At the same time, the role of drug therapy in the treatment of these conditions is not fully understood. Despite the clinical need, to date, the most effective pharmacological regimen for the treatment of ureteral stones has not yet been determined [5].

### PURPOSE OF THE STUDY

Evaluation of the possibilities of expulsive drug therapy in the treatment of patients with ureteral stones in men.

### MATERIAL AND METHODS

In the period from February 2021 to April 2022, 50 patients with stones ( $d < 8\text{mm}$ ) of the ureter were examined and treated at the State Institution "Republican Specialized Scientific and Practical Medical Center of Urology" for examination and treatment. The patients were aged

20 to 75 years (mean age  $39.3 \pm 2.5$ ), all males. The size of the stones varied from 3.5 mm to 8.0 mm (mean  $5.7 \pm 0.3$ ). Exclusion criteria from the study were acute urinary tract infection, diabetes mellitus, a history of independent stone passage or previous surgery on the ipsilateral ureter, age younger than 20 years. The criteria for discontinuation of conservative treatment and the indication for active treatment were the patient's wish, intractable pain, hyperthermia and/or the absence of independent stone passage after 3 weeks of observation. Observation of patients was also terminated in the case of independent discharge of the stone. The protocol of clinical examination of patients with urolithiasis disease included assessment of complaints and history taking, physical examination, ultrasound examination of the kidneys and urinary tract, X-ray examination, qualitative and quantitative microscopic analysis of urine, bacteriological culture of urine was performed according to indications, if necessary (ESWL) - biochemical and hematological tests. An invariable component of the tactics of treating patients with ureteral stones was the so-called expulsive drug therapy - abundant fluid intake to achieve diuresis up to 2 liters per day, regardless of the fluid taken, and the administration of ketoprofen (50 mg intramuscularly) for pain. The criteria for evaluating the effectiveness of treatment were the frequency of stone passage from the ureter, the time required for the stone to pass, the amount of ketoprofen used, the need for hospitalization, the severity of the pain syndrome, which was assessed by the visual pain assessment scale (VAS - visual analog scale).

## RESULTS AND DISCUSSION

When using expulsive drug therapy, the incidence of stone passage was 80%. The size of the departed stones was  $6.0 \pm 0.4$  mm, the average time required for the passage of the stone was  $7.3 \pm 0.5$  days. During the observation period,  $200 \pm 10.5$  mg of ketoprofen was used on average for the relief of pain per patient. There was no need for hospitalization of patients. Unexpressed side effects associated with expulsive therapy were noted in 10 (20%) patients, but none of them stopped treatment. In 5 patients, nausea and vomiting were observed, in 2 - general weakness, which were associated with recurrent attacks of renal colic. The severity of pain on a visual analogue scale was  $6.1 \pm 0.3$  (from 2 to 9) points. In the course of treatment, pain periodically became less intense ( $p < 0.05$ ).

Of the 10 (20%) patients who did not pass stones during the observation period, 8 underwent ESWL, 1 underwent UR ureterolithotripsy, 1 underwent relocation of the ureteral stone into the kidney and percutaneous nephrotripty.

Analysis of the results of expulsive therapy depending on the localization of the stone showed that in patients with stones in the lower third of the ureter, the rate of stone passage was 16.4% higher than in patients with stones in the upper or middle third of the ureter. The time interval until the moment of stone passage was also somewhat longer in the group of patients with stones in the lower third of the ureter, however, this difference was not significant (Table 1). The size of the stone, determined by the initial imaging methods, did not differ significantly in the groups of patients on average. In addition, there were no significant differences in the size of the passed stones in patients of the two groups (Table 1). No differences were found between the compared groups in terms of pain intensity at admission, as well as the number of renal colic before admission (Table 2). As the analysis of the results of treatment shows, both the intensity of pain and the number of renal colic in the course of treatment significantly decreased

significantly in patients of both groups. A similar situation was observed with respect to episodes of renal colic on admission and during treatment. During treatment, the total dose of ketoprofen, reflecting the need for analgesics, in the group of patients with stones in the lower third of the ureter was lower than in patients with stones in the upper or middle third of the ureter. However, the mean values of the total dose of ketoprofen per patient did not differ significantly.

### CONCLUSIONS

1. A conservative approach should be considered as a treatment option for uncomplicated ureteral stones.
2. The optimal pharmacological scheme of expulsive therapy has not yet been developed, but its use is recommended due to its high efficacy, minimal side effects and good patient tolerance.
3. Further clinical multicenter studies are needed in this area to clarify all aspects of the use of expulsive therapy in the treatment of patients with ureteral stones.

**Table 1 Effect of expulsive drug therapy on ureteral stone passage depending on its location, n=50**

Parameter	Localization of the ureteral stone		P
	in the upper or middle third of the ureter, n=24	in the lower third of the ureter, n=26	
Stone size at admission, mm	8,0 (4,0-8,0)	5,0 (3,5-8,0)	0,10
Stone evacuation rate, n (%)	14 (60,9) 40,8 – 77,8	17 (77,3) 56,6 – 89,9	< 0,2
Time to stone evacuation, days	7,3 (5,0 – 20,0)	6,8 (3,0-15,0)	0,18
The size of the departed stone, mm	5,0 (3,5-5,0)	6,0 (3,5-6,0)	0,95

**Table 2 The effectiveness of expulsive drug therapy in the treatment of pain, depending on the localization of the stone, n=50**

Parameter	Localization of the ureteral stone		P
	in the upper or middle third of the ureter, n=24	in the lower third of the ureter, n=26	
Pain intensity on admission, VAS score	9,0 (8,0-9,0)	9,0 (7,0-10,0)	0,85
Pain intensity after 1 week, VAS score	6,0 (5,0-7,0)	6,0 (4,8-7,0)	0,95
Number of episodes of renal colic before treatment	5,0 (3,0-7,0)	3,0 (2,0-7,3)	0,46
Number of episodes of renal colic during follow-up	4,0 (3,0-7,0)	3,5 (1,8-5,3)	0,53
Need for analgesics: ketoprofen mg	200,0 (100,0-200,0)	150 (50,0-150)	0,21



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