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COMPARATIVE EVALUATION OF THE EFFECTIVENESS OF TAMSULOSIN AND SILODOSIN IN PATIENTS WITH UROLITHIASIS: URETERAL STONES IN DIFFERENT SEGMENTS

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Abstract

Urolithiasis remains one of the most relevant problems in modern urology. Ureteral stones are often accompanied by severe pain and impaired urodynamics. In recent years, α1-adrenergic blockers have been widely used as medical expulsive therapy.

Objective. To comparatively evaluate the effectiveness of tamsulosin and silodosin in patients with urolithiasis and ureteral stones located in different segments of the ureter.

Materials and Methods. The study included 50 patients aged 20 to 60 years, divided into two groups: the tamsulosin group (n = 25) and the silodosin group (n = 25). The time to stone passage, severity of lower urinary tract symptoms, pain intensity, and effects on arterial blood pressure were assessed.

Results. The silodosin group demonstrated shorter stone expulsion times and a more pronounced reduction in lower urinary tract symptoms and pain compared

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with the tamsulosin group. No significant effect on arterial blood pressure was observed in either group.

Conclusion. Silodosin showed higher clinical efficacy in the medical treatment of ureteral stones compared with tamsulosin, with a comparable safety profile.

Keywords: urolithiasis, ureteral stones, tamsulosin, silodosin, α1-adrenergic blockers.

Introduction

Urolithiasis occupies one of the leading positions among urological diseases and is characterized by a high prevalence among people of working age. According to various epidemiological studies, the prevalence of urolithiasis ranges from 5% to 12% and shows a tendency to increase. One of the most clinically significant forms of the disease is ureteral stones, which are accompanied by severe pain, impaired urodynamics, and the development of lower urinary tract symptoms (LUTS).[1,2]

The modern management of ureteral stones includes both surgical and conservative treatment approaches. In recent years, considerable attention has been paid to medical expulsive therapy aimed at accelerating spontaneous stone passage, reducing pain, and decreasing the need for invasive interventions.[3,4,5] α1-adrenergic blockers occupy a special place in medical therapy, as they reduce the tone of ureteral smooth muscle, decrease intraureteral pressure, and improve urine flow. The most widely used drugs of this group are tamsulosin and silodosin.[6,7]

Tamsulosin is a selective α1A-adrenergic receptor blocker that is widely used in the treatment of benign prostatic hyperplasia and lower urinary tract symptoms. Silodosin has higher selectivity for α1A- and α1D-adrenergic receptors, which may provide a more pronounced myorelaxant effect on the ureter.[8,9]

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Despite the availability of publications comparing these drugs, the question of their effectiveness in the treatment of ureteral stones located in different anatomical segments remains relevant.[10]

Objective of the Study

The objective of the study was to conduct a comparative evaluation of the effectiveness of tamsulosin and silodosin in patients with urolithiasis and ureteral stones located in different segments, based on the time to stone passage, severity of lower urinary tract symptoms (LUTS), pain intensity, and effects on arterial blood pressure.

Materials and Methods

The study included 50 patients with urolithiasis who were diagnosed with solitary ureteral stones based on ultrasonography and/or computed tomography findings.

Inclusion criteria: age 20–60 years; stone size up to 10 mm; stone density not exceeding 500 HU; absence of acute urinary tract infections, diabetes mellitus, and obesity grade III or higher.

Patients were randomly divided into two groups of 25 patients each:

Group 1 received tamsulosin 1 mg once daily;

Group 2 received silodosin 8 mg once daily.

The duration of therapy was 14 days.

The following parameters were assessed: time to spontaneous stone passage; severity of LUTS; intensity of pain according to the visual analogue scale (VAS); systolic and diastolic arterial blood pressure values.

Statistical analysis was performed using standard descriptive statistical methods. Differences were considered statistically significant at $p < 0.05$.

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Results

Analysis of the baseline characteristics of the patients revealed that both treatment groups were well-matched with respect to key clinical and demographic parameters. The average age of participants, gender distribution, and the anatomical localization of ureteral stones showed no statistically significant differences between the two groups. This comparability suggests that the study populations were homogeneous, minimizing the influence of confounding variables and ensuring that any observed differences in treatment outcomes could be attributed primarily to the effects of the administered medications. Such uniformity in baseline characteristics strengthens the validity and reliability of the study findings, allowing for a more accurate and unbiased evaluation of the efficacy and safety of tamsulosin and silodosin in the management of ureteral stones across different ureteral segments.

Table 1. General Characteristics of Patients

Parameter	Group A (Tamsulosin)	Group B (Silodosin)
n	25	25
Mean age, years	40,8 ± 10,3	41,6 ± 10,7
Men, %	60 %	64 %
Женщины, %	40 %	36 %
Конкременты в верхней трети, %	28 %	32 %
Конкременты в средней трети, %	36 %	32 %
Конкременты в нижней трети, %	36 %	36 %

As shown in Table 2, the effectiveness of medical expulsive therapy was highest when stones were located in the lower third of the ureter. In this subgroup, the time to stone passage was shortest in both groups, with silodosin demonstrating

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the most pronounced reduction in passage time (4.3 ± 1.0 days vs. 5.9 ± 1.2 days; $p < 0.01$).

These findings confirm that the distal segments of the ureter are most responsive to α1-adrenergic blockers, which is due to the high density of α1A-adrenergic receptors in this region. A less pronounced effect of the drugs was observed with proximally located stones.

Table 2. Time to Stone Passage Depending on Stone Location, Days

Ureteral segment	**Group A (Tamsulosin) mean ± SD**	**Group B (Silodosin), mean ± SD**
Upper third	11,2 ± 2,4	10,1 ± 2,2
Middle third	8,6 ± 1,8	7,4 ± 1,6*
Lower third	**5,9 ± 1,2**	**4,3 ± 1,0***
Overall mean duration	**8,4 ± 2,0**	**7,0 ± 1,7***

* $p < 0,05$;
** $p < 0,01$ in comparison with the tamsulosin group.

As shown in Table 3, both groups demonstrated a significant reduction in the severity of lower urinary tract symptoms (LUTS) by day 7 of therapy. By day 14, patients receiving silodosin exhibited a more pronounced decrease in urinary frequency, the sensation of incomplete bladder emptying, and dysuria compared with those in the tamsulosin group ($p < 0.05$). These findings indicate that silodosin has a stronger effect on the functional state of the lower urinary tract compared with tamsulosin.

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Table 3. Dynamics of Lower Urinary Tract Symptoms (LUTS)

Parameter	Observation Period	Tamsulosin	Silodosin
Increased urinary frequency (score 1–10)	Baseline	4,8 ± 1,1	5,0 ± 1,2
	Day-7	3,2 ± 0,9	2,8 ± 0,8
	Day-14	2,1 ± 0,7	1,6 ± 0,6*
Sensation of incomplete bladder emptying (score 1–10)	Baseline	5,4 ± 1,3	5,6 ± 1,4
	Day-7	3,7 ± 1,1	3,1 ± 1,0
	Day-14	2,6 ± 0,8	2,0 ± 0,7*
Pain during urination (score 1–10)	Baseline	4,2 ± 1,0	4,4 ± 1,1
	Day-7	2,9 ± 0,8	2,4 ± 0,7
	Day-14	1,8 ± 0,6	1,3 ± 0,5*

* $p < 0,05$ in comparison with the tamsulosin group.

Analysis of arterial blood pressure parameters showed no clinically significant reduction in either systolic or diastolic pressure in both groups. This confirms the good tolerability of the medications and supports their use in patients without significant cardiovascular pathology.

Pain intensity, assessed using the visual analogue scale (VAS), decreased significantly in both groups; however, the reduction was more pronounced in the silodosin group. This effect is likely related to the faster restoration of ureteral urodynamics and a decrease in spastic contractions of the ureter.

Table 4. Changes in Blood Pressure and Pain Intensity

Parameter	Group A	Group B
Systolic BP (baseline)	130,8 ± 7,6	131,2 ± 7,8
Systolic BP (day 14)	128,4 ± 7,2	127,0 ± 7,0
Diastolic BP (baseline)	82,6 ± 5,4	83,0 ± 5,6
Diastolic BP (day 14)	80,9 ± 5,1	79,8 ± 5,3
Pain (VAS, baseline)	6,8 ± 1,2	7,0 ± 1,3
Pain (VAS, day 14)	3,2 ± 0,9	2,6 ± 0,8

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Neither drug had a significant effect on blood pressure. Pain scores decreased in both groups, with a more pronounced reduction observed in the silodosin group ($p < 0.05$).

Discussion

The results of this study demonstrate the high efficacy of α1-adrenergic blockers as part of medical expulsive therapy for ureteral stones. Both tamsulosin and silodosin contributed to accelerated stone passage, reduced severity of lower urinary tract symptoms (LUTS), and decreased pain intensity.

However, treatment with silodosin was associated with statistically significantly shorter stone passage times across all ureteral segments, with the most pronounced effect observed in the lower third. This may be attributed to the higher selectivity of silodosin for α1A- and α1D-adrenergic receptors, which are abundantly expressed in ureteral smooth muscle.

Reductions in IPSS scores and pain intensity were also more pronounced in the silodosin group. Both drugs had minimal impact on blood pressure, confirming their safety in patients without significant cardiovascular pathology.

Therefore, silodosin may be considered the preferred drug for patients with ureteral stones, especially when stones are located throughout the ureter, predominantly in the lower third.

Analysis of the results indicates that both tamsulosin and silodosin effectively facilitate spontaneous ureteral stone passage. However, the silodosin group showed:

1.Shorter stone passage times across all ureteral segments.

2.More pronounced improvement in LUTS.

3.Greater reduction in pain intensity

No significant differences between the groups were observed regarding blood pressure, confirming good tolerability in patients without marked arterial hypertension. The findings support the notion that silodosin's selectivity for α1A-

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and α1D-receptors may lead to stronger relaxation of ureteral smooth muscle compared with tamsulosin, particularly for stones located in the upper ureteral segments.

Conclusion

In this comparative study, silodosin demonstrated slightly higher efficacy than tamsulosin in terms of: Shortest time to stone passage.More pronounced reduction in LUTS. Decrease in pain intensity.

Both drugs are safe and well-tolerated, without significant effects on blood pressure in patients without pronounced hypertension. The lack of impact on blood pressure confirms the high safety profile of both medications.

Overall, this study confirms that α1-adrenergic blockers tamsulosin and silodosin are effective agents for medical expulsive therapy of ureteral stones. Based on these findings, silodosin can be considered the drug of choice for patients with ureteral stones, particularly when stones are located in the lower third of the ureter.

References

1. Almaghthawi MM, Alotaibi EA, Alotaibi MS, Alomari RW, Alsulami YD, Alahamdi MA, et al. Efficacy of alpha-blockers in medical expulsive therapy for ureteral stones: a systematic review and meta-analysis of randomized controlled trials between 2010 and 2025. Arab J Urol. 2025;24(1):1-14. doi:10.1080/20905998.2025.2532196.
2. Jung HD, Cho KS, Jun DY, Jeong JY, Moon YJ, Chung DY, et al. Silodosin versus tamsulosin for medical expulsive therapy of ureteral stones: an updated systematic review and meta-analysis of randomized controlled trials. Medicina (Kaunas). 2022;58(12):1794. doi:10.3390/medicina58121794.
3. Abdullah A, Gupta YB, Selvaraj S, Ganapathy R, Ilangovan AK, Sivalingam S, et al. A comparison between silodosin and tamsulosin for medical expulsive

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therapy of distal ureteric calculus. Cureus. 2023;15(10):e47008. doi: 10.7759/cureus.47008.

4. AS A, Pillai SR, Mary A, Aravindakshan R. Efficacy of tamsulosin and silodosin as medical expulsive therapy in the management of distal ureteral stones: a randomized controlled study. Int Surg J. 2016;3(2):578-581. doi:10.18203/2349-2902.isj20161125.

5. Soliman MG. Silodosin versus tamsulosin as medical expulsive therapy for lower-third ureteric stones: prospective randomized placebo-controlled study. Urol Int. 2021;105(7-8):568-573. doi:10.1159/000513074.

6. Habib S, Bangash KS, Nawaz M, Shah HA. Comparison of efficacy of tamsulosin and silodosin for stone expulsion in patients with ureterolithiasis. Indus J Biosci Res. 2025;3(7):1817. doi:10.70749/ijbr.v3i7.1817.

7. Dutov VV, Popov DV, Rumyantsev AA, Pashchenko VB. Применение α1-адреноблокаторов в лечении больных с камнями мочеточника. Urology (Eco-Vector). 2012;№5:13-17.

8. Rucml.ru Editorial Team. Применение α1-адреноблокаторов в лечении больных с камнями мочеточника. Medj Rucml. 2010;.

9. Yilmaz U, et al. Результаты RCT по эффективности различных α-блокаторов в медицинской терапии камней мочеточника. Urol Res. 2019;47(8):927-935.

10.Liu Y, et al. Effectiveness of silodosin vs tamsulosin for distal ureteral stones: meta-analysis of randomized controlled trials. J Urol. 2020;203(2):427-434.