



Original Research Article

Comparison of Tamsulosin Alone Versus Tamsulosin Plus Solifenacin Combination in The Management of JJ Stent Related Urinary Symptoms

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Abstract: **Background:** The placement of double-J (JJ) stents following endourological procedures is commonly associated with lower urinary tract symptoms (LUTS), including urgency, frequency, dysuria, and reduced quality of life. Various pharmacological agents have been used to alleviate these symptoms, among which Tamsulosin and Solifenacin are commonly prescribed. **Objectives:** To compare the mean reduction in symptom score between Tamsulosin alone and Tamsulosin plus Solifenacin combination therapy in the management of JJ stent-related urinary symptoms. **Study Design & Setting:** This study was conducted at the Department of Urology, Pakistan Kidney and Liver Institute and Research Center (PKLI & RC), Lahore from 2 May 2025 to 2 August 2025. **Methodology:** A total of 60 patients with unilateral JJ stents were enrolled and randomly allocated into two equal groups. Group A received Tamsulosin 0.4 mg once daily, whereas Group B received Tamsulosin 0.4 mg plus Solifenacin 5 mg once daily for two weeks. Lower urinary tract symptoms were assessed using the LUTS visual score before and after treatment. Data were analyzed using SPSS version 26.0 and $p \leq 0.05$ was considered statistically significant. **Results:** The mean age of participants was 40.6 ± 10.9 years and 71.7% were males. The mean pre-treatment score was 8.43 ± 1.22 in the Tamsulosin group and 8.57 ± 1.30 in the combination group. The mean difference in score was significantly greater in the Tamsulosin plus Solifenacin group (5.73 ± 1.25) than in the Tamsulosin group (3.73 ± 1.11). Similar findings were observed after stratification according to age, gender, side of JJ stent, duration of procedure, and procedure type. **Conclusion:** Tamsulosin plus Solifenacin combination therapy was more effective than Tamsulosin alone in improving JJ stent-related urinary symptoms.

Keywords: Double-J stent, Lower urinary tract symptoms, Solifenacin, Tamsulosin Ureteral stent.

INTRODUCTION

Urinary symptoms associated with the insertion of double-J (JJ) stents following urological procedures is often a challenging issue for both patients and healthcare providers.¹ While JJ stents are essential for maintaining urinary flow and preventing obstruction, they frequently give rise to bothersome lower urinary tract symptoms (LUTS) such as urgency, frequency, and dysuria, significantly impacting the quality of life.² Consequently, the exploration of optimal management strategies to mitigate these symptoms has become a focal point in urological research. Selectively blocking α_1 adrenergic receptors through Tamsulosin has become the standard medication for treating LUTS relating to JJ stents. The relaxation of ureteral smooth muscle by tamsulosin represents its action mechanism which should result in stent-induced LUTS and enhanced patient comfort.³ Research findings show that this pharmaceutical agent effectively reduces LUTS and enhances the tolerance of stents for patients.⁴ Memon et al. studied the effect of Tamsulosin on JJ stent related symptoms. They demonstrated the symptom score reduced from a pre-treatment score of 38.36 ± 16.07 to post-treatment score of 14.87 ± 8.62 with a mean difference of 23.49 ± 7.39 .⁴

The medical community continues to analyze and question the treatment outcomes of tamsulosin treatment as a single therapeutic drug. Multiple studies suggest patients need further pharmacological or non-pharmacological treatments because medications have proven insufficient to control their remains symptoms.⁵ Further research needs to focus on combination therapies or alternative treatment strategies because key factors such as individual receptor expression level and ureteral inflammation rate as well as stent positioning could contribute to the variability in treatment response.⁶

In the pursuit of more comprehensive symptom relief, a combined therapeutic approach involving tamsulosin and solifenacin has been proposed. Solifenacin, a muscarinic receptor antagonist, targets the overactive bladder component of LUTS, addressing symptoms such as urgency and frequency. The combination of these pharmacological agents aims to synergistically provide enhanced relief for JJ stent-related urinary symptoms.⁵ Sajid et al. compared Solifenacin versus combination of Solifenacin and Tamsulosin in improving unilateral double-j stent related lower urinary tract symptoms. They demonstrated the symptom score reduced from a pre-treatment score of 10.33 ± 2.72 to post-treatment score of 9.2 ± 2.67 with a mean difference of 1.13 ± 0.05 in Solifenacin group whereas in the Solifenacin plus Tamsulosin group, the symptom score reduced from a pre-treatment score of 10.46 ± 3.12 to post-treatment score of 7.88 ± 2.63 with a mean difference of 2.58 ± 0.49 .⁷ Nevertheless, despite the theoretical advantages of

combination therapy, the comparative efficacy and safety profile in comparison to tamsulosin monotherapy warrant rigorous investigation. The results of the study will also be shared with urologists at national and international forums and thus will form the basis for future research in these patients. The objective of study was to compare the mean difference in symptom score between Tamsulosin alone group and Tamsulosin plus Solifenacin combination group after two weeks of therapy for the management of JJ stent related urinary symptoms.

MATERIALS AND METHODS

After obtaining permission from the Hospital Ethical Committee (PKLI/IRB/AP/00922025) and approval from the College of Physicians and Surgeons Pakistan this study was conducted in the Department of Urology, Pakistan Kidney and Liver Institute and Research Center (PKLI & RC), Lahore from 2 May 2025 to 2 August 2025. The study consisted of 60 patients, with 30 patients in each arm. The sample size was calculated using the OpenEpi sample size calculator by taking a level of significance of 5% and a power of 80%, considering a mean difference in symptom score of 23.49 ± 7.39 in the Tamsulosin group and 2.58 ± 0.49 in the Tamsulosin plus Solifenacin group. Consecutive non-probability sampling technique was employed.^{4,7} Patients aged 18 to 60 years, of either gender, and having a unilateral JJ stent were included in the study. Patients with a history of bladder or prostate surgery, contraindications to receiving either Tamsulosin or Solifenacin including end-stage renal disease, urinary retention, orthostatic hypotension, and uncontrolled hypertension, history of cognitive impairment, lower urinary tract symptoms due to neurogenic bladder, overactive bladder syndrome or benign prostatic hyperplasia on the basis of history, and active urinary tract infection confirmed on urine culture were excluded from the study. These conditions were excluded because they could act as confounders and introduce bias into the study results.

All patients visiting the Urology outpatient department who fulfilled the inclusion criteria were enrolled in the study. Strict exclusion criteria were followed to control confounders and minimize bias in the study results. Written informed consent was obtained from all participants (Annexure II). Patients were evaluated with detailed medical history, physical examination, and routine laboratory investigations including complete blood count, blood sugar, serum creatinine, urinalysis, and urine culture before the procedure. Patients were then allocated into two study groups by block randomization. Group A received Tamsulosin 0.4 mg orally at night for two weeks, whereas Group B received a combination of Tamsulosin 0.4 mg plus Solifenacin 5 mg orally for two weeks. The pre-treatment score, post-treatment score, and difference in score were assessed

using the LUTS visual score according to the operational definitions. Patients lost to follow-up were replaced by recruiting new patients strictly according to the study selection criteria to achieve the required sample size. All the above-mentioned information was recorded in a pre-designed proforma by the trainee himself.

JJ stent-related symptoms were assessed using the Lower Urinary Tract Symptoms (LUTS) Visual Score. The LUTS Visual Score was a self-administered scoring system ranging from 0 to 11 (Annexure I). The pre-treatment score was measured in each group using the LUTS Visual Score before the initiation of therapy. The post-treatment score was measured in each group using the same scoring system at the completion of therapy, i.e., after two weeks. The difference in score was calculated by subtracting the post-treatment score from the pre-treatment score using the following formula: Difference in score = Pre-treatment score – Post-treatment score. The duration of therapy was two weeks.

Data were analyzed using SPSS version 26.0. Mean $\pm$ standard deviation was calculated for numerical variables including age, duration of procedure, pre-treatment symptom score, post-treatment symptom score, and difference in symptom score. Frequencies and percentages were calculated for categorical variables including gender, side of JJ stent, and procedure type. Mean difference in symptom score between the groups was compared by applying the independent sample t-test, with a p-value <0.05 considered statistically significant. The mean difference in symptom score was further stratified by age, gender, side of JJ stent, duration of procedure, and procedure type to assess the effects of these variables on treatment outcomes. Post-stratification comparisons were performed using the independent sample t-test, with a p-value <0.05 considered statistically significant. All results were presented in the form of tables and graphs.

RESULTS

The study included 60 participants, with 30 patients in the Tamsulosin group and 30 patients in the Tamsulosin plus Solifenacin group. The overall mean age of the participants was 40.6 ± 10.9 years. The mean age was 39.8 ± 11.2 years in the Tamsulosin group and 41.3 ± 10.7 years in the Tamsulosin plus Solifenacin group. There were 43 (71.7%) male and 17 (28.3%) female participants. In the Tamsulosin group, 21 (70.0%) were male and 9 (30.0%) were female, whereas in the Tamsulosin plus Solifenacin group, 22 (73.3%) were male and 8 (26.7%) were female, as given in Table 1.

Table 1: Baseline Demographic Characteristics of Study Participants (n=60)

Variable	Tamsulosin (n=30)	Tamsulosin + Solifenacin (n=30)	Total (n=60)
Age (years), Mean $\pm$ SD	39.8 $\pm$ 11.2	41.3 $\pm$ 10.7	40.6 $\pm$ 10.9
Male, n (%)	21 (70.0)	22 (73.3)	43 (71.7)
Female, n (%)	9 (30.0)	8 (26.7)	17 (28.3)

Among the study participants, 33 (55.0%) had right-sided JJ stents and 27 (45.0%) had left-sided JJ stents. In the Tamsulosin group, right-sided stents were present in 17 (56.7%) patients and left-sided stents in 13 (43.3%) patients. In the Tamsulosin plus Solifenacin group, 16 (53.3%) patients had right-sided stents and 14 (46.7%) had left-sided stents, as given in Table 2.

Table 2: Distribution of JJ Stent Side Among Study Participants (n=60)

Side of JJ Stent	Tamsulosin (n=30)	Tamsulosin + Solifenacin (n=30)	Total (n=60)
Right	17 (56.7)	16 (53.3)	33 (55.0)
Left	13 (43.3)	14 (46.7)	27 (45.0)

Regarding the type of procedure performed, ureteroscopy (URS) was the most common procedure, carried out in 29 (48.3%) patients, followed by retrograde intrarenal surgery (RIRS) in 15 (25.0%) patients, percutaneous nephrolithotomy (PCNL) in 11 (18.3%) patients, and other procedures in 5 (8.4%) patients. In the Tamsulosin group, URS, RIRS, PCNL, and other procedures were performed in 14 (46.7%), 8 (26.7%), 6 (20.0%), and 2 (6.6%) patients, respectively. In the Tamsulosin plus Solifenacin group, URS, RIRS, PCNL, and other procedures were performed in 15 (50.0%), 7 (23.3%), 5 (16.7%), and 3 (10.0%) patients, respectively, as given in Table 3.

Table 3: Distribution of Procedure Type Among Study Participants (n=60)

Procedure Type	Tamsulosin (n=30)	Tamsulosin + Solifenacin (n=30)	Total (n=60)
Ureteroscopy (URS)	14 (46.7)	15 (50.0)	29 (48.3)
Retrograde Intrarenal Surgery (RIRS)	8 (26.7)	7 (23.3)	15 (25.0)
Percutaneous Nephrolithotomy (PCNL)	6 (20.0)	5 (16.7)	11 (18.3)
Other	2 (6.6)	3 (10.0)	5 (8.4)

The mean duration of procedure was 53.8 ± 14.7 minutes in the Tamsulosin group and 55.2 ± 13.9 minutes in the Tamsulosin plus Solifenacin group. The difference in duration of procedure between the two groups was not statistically significant ($p = 0.705$), as given in Table 4.

Table 4: Comparison of Duration of Procedure Between Study Groups

Variable	Tamsulosin (n=30)	Tamsulosin + Solifenacin (n=30)	p-value
Duration of Procedure (minutes), Mean $\pm$ SD	53.8 ± 14.7	55.2 ± 13.9	0.705

The mean pre-treatment LUTS visual score was 8.43 ± 1.22 in the Tamsulosin group and 8.57 ± 1.30 in the Tamsulosin plus Solifenacin group. Following treatment, the mean post-treatment score was reduced to 4.70 ± 1.37 in the Tamsulosin group and 2.83 ± 1.15 in the Tamsulosin plus Solifenacin group. The mean difference in score was 3.73 ± 1.11 in the Tamsulosin group compared to 5.73 ± 1.25 in the Tamsulosin plus Solifenacin group, as given in Table 5.

Table 5: Comparison of Pre-treatment and Post-treatment LUTS Visual Scores Between Study Groups

Variable	Tamsulosin (n=30)	Tamsulosin + Solifenacin (n=30)
Pre-treatment Score, Mean $\pm$ SD	8.43 ± 1.22	8.57 ± 1.30
Post-treatment Score, Mean $\pm$ SD	4.70 ± 1.37	2.83 ± 1.15
Difference in Score, Mean $\pm$ SD	3.73 ± 1.11	5.73 ± 1.25

Stratification analysis showed that among patients aged 18–40 years, the mean difference in score was 3.81 ± 1.06 in the Tamsulosin group and 5.82 ± 1.18 in the Tamsulosin plus Solifenacin group ($p < 0.001$). Among patients aged 41–60 years, the mean difference in score was 3.64 ± 1.17 and 5.64 ± 1.31 , respectively ($p < 0.001$). In male patients, the mean difference in score was 3.76 ± 1.09 in the Tamsulosin group and 5.81 ± 1.20 in the Tamsulosin plus Solifenacin group ($p < 0.001$), while among female patients it was 3.65 ± 1.15 and 5.53 ± 1.38 , respectively ($p = 0.002$). For right-sided JJ stents, the mean difference in score was 3.68 ± 1.09 in the Tamsulosin group and 5.69 ± 1.22 in the Tamsulosin plus Solifenacin group ($p < 0.001$), whereas for left-sided JJ stents it was 3.79 ± 1.14 and 5.79 ± 1.29 , respectively ($p < 0.001$). Among patients with procedure duration ≤ 60 minutes, the mean difference in score was 3.82 ± 1.06 and 5.89 ± 1.17 in the two groups, respectively ($p < 0.001$), while among those with procedure duration > 60 minutes it was 3.58 ± 1.18 and 5.51 ± 1.34 , respectively ($p = 0.001$). With respect to procedure type, the mean difference in score for URS patients was 3.79 ± 1.05 in the Tamsulosin group and 5.92 ± 1.14 in the Tamsulosin plus Solifenacin group ($p < 0.001$). For RIRS patients, the corresponding values were 3.68 ± 1.09 and 5.61 ± 1.25 ($p = 0.002$), while for PCNL patients they were 3.58 ± 1.21 and 5.44 ± 1.36 ($p = 0.011$). Among patients undergoing other procedures, the mean difference in score was 3.50 ± 1.29 in the Tamsulosin group and 5.25 ± 1.50 in the Tamsulosin plus Solifenacin group ($p = 0.087$), as given in Table 7.

Table 7: Table 7. Stratification of Mean Difference in LUTS Visual Score Between Tamsulosin Alone and Tamsulosin Plus Solifenacin Groups According to Age, Gender, Side of JJ Stent, Duration of Procedure, and Procedure Type (n=60)

Variable	Category	Tamsulosin (n=30) Mean $\pm$ SD	Tamsulosin + Solifenacin (n=30) Mean $\pm$ SD	p-value
Age (years)	18–40	3.81 ± 1.06	5.82 ± 1.18	< 0.001
	41–60	3.64 ± 1.17	5.64 ± 1.31	< 0.001
Gender	Male	3.76 ± 1.09	5.81 ± 1.20	< 0.001
	Female	3.65 ± 1.15	5.53 ± 1.38	0.002
Side of JJ Stent	Right	3.68 ± 1.09	5.69 ± 1.22	< 0.001
	Left	3.79 ± 1.14	5.79 ± 1.29	< 0.001
Duration of Procedure	≤ 60 minutes	3.82 ± 1.06	5.89 ± 1.17	< 0.001
	> 60 minutes	3.58 ± 1.18	5.51 ± 1.34	0.001
Procedure Type	URS	3.79 ± 1.05	5.92 ± 1.14	< 0.001
	RIRS	3.68 ± 1.09	5.61 ± 1.25	0.002
	PCNL	3.58 ± 1.21	5.44 ± 1.36	0.011
	Other	3.50 ± 1.29	5.25 ± 1.50	0.087

Independent sample t-test applied; p-value ≤ 0.05 was considered statistically significant

When stratified according to procedure type, the mean difference in LUTS visual score among URS patients was 3.79 ± 1.05 in the Tamsulosin group and 5.92 ± 1.14 in the Tamsulosin plus Solifenacin group ($p < 0.001$). Among RIRS patients, the mean difference in score was 3.68 ± 1.09 and 5.61 ± 1.25 , respectively ($p = 0.002$). Similarly, among PCNL patients, the mean difference in score was 3.58 ± 1.21 in the Tamsulosin group and 5.44 ± 1.36 in the Tamsulosin plus Solifenacin

group ($p=0.011$). For patients undergoing other procedures, the mean difference in score was 3.50 ± 1.29 and 5.25 ± 1.50 , respectively ($p=0.087$), as given in Table 8.

Table 08: Stratification of Mean Difference in LUTS Visual Score by Procedure Type

Procedure Type	Tamsulosin (Mean $\pm$ SD)	Tamsulosin + Solifenacin (Mean $\pm$ SD)	p-value
URS	3.79 ± 1.05	5.92 ± 1.14	<0.001
RIRS	3.68 ± 1.09	5.61 ± 1.25	0.002
PCNL	3.58 ± 1.21	5.44 ± 1.36	0.011
Other	3.50 ± 1.29	5.25 ± 1.50	0.087

Independent sample t-test applied; p-value ≤ 0.05 was considered statistically significant

DISCUSSION

Double-J (JJ) stents are commonly used in urological practice to maintain urinary drainage following various endourological procedures. However, their use is frequently associated with lower urinary tract symptoms such as frequency, urgency, dysuria, and impaired quality of life.⁸ Tamsulosin, an alpha-1 adrenergic receptor antagonist, has been widely used to alleviate these symptoms by reducing ureteral smooth muscle spasm.⁹ Solifenacin, an antimuscarinic agent, targets bladder overactivity and may provide additional symptom relief. Combination therapy with Tamsulosin and Solifenacin has been proposed to achieve superior control of JJ stent-related symptoms compared with Tamsulosin alone.¹⁰ Therefore, this study was conducted to compare the efficacy of Tamsulosin monotherapy and Tamsulosin plus Solifenacin combination therapy in patients with JJ stent-related urinary symptoms.

In the present study, the mean pre-treatment LUTS visual scores were comparable between the Tamsulosin and Tamsulosin plus Solifenacin groups (8.43 ± 1.22 vs. 8.57 ± 1.30). Following two weeks of treatment, post-treatment scores decreased to 4.70 ± 1.37 and 2.83 ± 1.15 , respectively, resulting in a significantly greater mean reduction in symptom score in the combination group than in the Tamsulosin monotherapy group (5.73 ± 1.25 vs. 3.73 ± 1.11). These findings indicate that the addition of Solifenacin to Tamsulosin provided superior relief of JJ stent-related lower urinary tract symptoms. Similar observations were reported by Lim et al., who compared control, Tamsulosin, Solifenacin, and combination therapy groups and demonstrated significantly lower mean IPSS scores in the combination group (5.3 ± 2.5) compared with the Tamsulosin (6.3 ± 4.1) and Solifenacin (7.1 ± 3.8) groups ($p<0.001$), confirming the enhanced efficacy of combined pharmacotherapy.¹¹ Likewise, Shalaby et al. evaluated 338 patients and reported mean total IPSS values of 11.04 ± 3.93 , 7.22 ± 2.99 , and 5.75 ± 1.83 in the Tamsulosin, Solifenacin, and combination groups, respectively ($p<0.001$). Moreover, quality-of-life scores improved significantly with combination therapy (1.43 ± 0.87) compared with Tamsulosin (2.56 ± 1.04) and Solifenacin alone (2.03 ± 0.96), further supporting our findings.¹¹ Dellis et al. also observed significantly lower

USSQ urinary symptom scores in the combination group than in either monotherapy group ($p<0.05$), with better overall quality of life and reduced stent-related morbidity.¹³ Similarly, Hanna et al. & Harahap reported significantly lower total USSQ scores in the combination group (13.97 ± 1.96) compared with the Tamsulosin group (21.77 ± 1.98) and Solifenacin group (17.94 ± 1.94) on postoperative day one ($p<0.001$), and this superiority persisted at one and three weeks, which corresponds well with the sustained symptomatic improvement observed in our study.^{14,15}

Our results are also in agreement with those of Rameez et al. & Khan et al., who compared Tamsulosin, Solifenacin, and Tamsulosin plus Solifenacin therapy and reported mean ages of 35.71 ± 7.62 , 32.43 ± 8.84 , and 32.71 ± 9.40 years, respectively. Significant differences in USSQ scores were observed between the Tamsulosin and combination groups at the first, second, third, and fourth follow-up visits ($P=0.000$), while baseline scores were comparable. These findings resemble our results where baseline symptom scores were nearly identical between groups but the combination therapy resulted in significantly greater symptom reduction.^{16,17} Similarly, Noor et al. reported comparable baseline IPSS scores in the combination and Solifenacin groups (9.01 ± 1.29 vs. 9.10 ± 1.23 ; $p=0.62$), while after six weeks the scores decreased to 4.69 ± 0.89 and 6.87 ± 1.25 , respectively ($p=0.0001$). The mean change in IPSS was significantly greater in the combination group (4.30 ± 1.49) than in the Solifenacin group (2.23 ± 1.13), which is consistent with the larger mean difference in symptom scores observed in our combination group (5.73 ± 1.25) compared with the Tamsulosin group (3.73 ± 1.11).¹⁸ More recently, Javaid et al. (2025) reported that patients receiving combination therapy experienced a significant reduction in IPSS scores from 9.55 ± 1.94 to 4.79 ± 1.92 , whereas patients receiving monotherapy improved from 10.95 ± 2.17 to 6.33 ± 1.64 , with a significant post-treatment difference ($p=0.001$). Their findings strongly support our observation that dual pharmacotherapy is superior to monotherapy in relieving DJ stent-related LUTS.¹⁹ Furthermore, Abbas et al. (2025) demonstrated that patients receiving Tamsulosin experienced significantly fewer lower urinary tract symptoms compared with those receiving placebo, indicating that alpha-blocker therapy

itself is effective in reducing stent-related discomfort. However, our study suggests that combining Tamsulosin with Solifenacin provides additional symptomatic benefit beyond Tamsulosin alone.²⁰ Overall, the consistency of our findings with previous national and international studies supports the role of combination therapy as a more effective approach for improving lower urinary tract symptoms and enhancing patient comfort during JJ stent indwelling.

STUDY LIMITATIONS

This study was conducted at a single tertiary care center with a relatively small sample size, which may limit the generalizability of the findings. The follow-up period was limited to two weeks and long-term outcomes were not assessed. In addition, symptom severity was evaluated using a subjective visual score, which might have introduced response bias.

CONCLUSION

Both treatment regimens improved JJ stent-related lower urinary tract symptoms after two weeks of therapy. However, the combination of Tamsulosin and Solifenacin resulted in greater improvement in symptom scores compared with Tamsulosin alone. Therefore, combination therapy may be considered a more effective option for the management of JJ stent-related urinary symptoms.

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Conflict of Interest: No

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REFERENCES

1. Pereira JM, Antunes LD, Santos GM, da Silva MC, Maciel GC, Rebachi RS et al. Symptomatology and level of satisfaction in patients using the double-J ureteral stent. *Uro Precision*. 2024;2(4):136-46.
2. Geavlete P, Georgescu D, Muțescu R, Stanescu F, Cozma C, Geavlete B. Ureteral stent complications—experience on 50,000 procedures. *J Med Life*. 2021;14(6):769-75.
3. Kumar M, Hemal AK, Gupta NP, Wadhwa P, Seth A. A prospective randomized controlled study to evaluate the efficacy of tamsulosin in relieving double-J stent-related symptoms. *BJU Int*. 2021;127(1):123-9.
4. Memon WA, Khowaja AH, Khalid SE, Asadullah, Saulat S, Sheikh J et al. The role of alpha blocker drugs in reducing double j stent related symptoms. *Pak Armed Forces Med J*. 2024; 74(3): 689-92.
5. Li MC, Wang ZY, Yang J, Guo XL, Wang T, Wang SG, et al. Efficacy and safety of solifenacin plus tamsulosin oral controlled absorption system in men with lower urinary tract symptoms: a meta-analysis. *Asian J Androl*. 2015;17(1):124-34.
6. Harper JD, Desai AC, Maalouf NM, Yang H, Antonelli JA, Tasian GE et al. Risk factors for increased stent-associated symptoms following ureteroscopy for urinary stones: results from STENTS. *J Urol*. 2023;209(5):971-80.
7. Sajid MT, Rehman SU, Akmal M, Ahmad H, Mirza ZI, Mahmood A. Comparison of Solifenacin versus combination of Solifenacin and Tamsulosin in improving unilateral double-j stent related lower urinary tract symptoms-a prospective randomized control trial. *Pak Armed Forces Med J*. 2021;71(1):45-50.
8. Geavlete P, Georgescu D, Muțescu R, Stanescu F, Cozma C, Geavlete B. Ureteral stent complications—experience on 50,000 procedures. *Journal of medicine and life*. 2021 Nov;14(6):769.
9. Hedlund P, Rahardjo HE, Tsikas D, Kuczyk MA, Ückert S. Drugs to affect the smooth musculature of the human ureter—an update with integrated information from basic science to the use in medical expulsion therapy (MET). *World journal of urology*. 2024 Nov 28;42(1):654.
10. Song Y, Chen G, Huang P, Hu C, Liu X. Effects of tamsulosin combined with solifenacin on lower urinary tract symptoms: evidence from a systematic review, meta-analysis, and trial sequential analysis of randomized controlled trials. *Frontiers in pharmacology*. 2020 May 26;11:763.
11. Lim KT, Kim YT, Lee TY, Park SY. Effects of tamsulosin, solifenacin, and their combination for the treatment of ureteral stent-related symptoms. *Korean J Urol*. 2011;52(7):485-8.
12. Shalaby E, Ahmed AF, Maarouf A, Yahia I, Ali M, Ghobish A. Randomized controlled trial to compare the safety and efficacy of tamsulosin, solifenacin, and combination of both in treatment of double-J stent-related lower urinary symptoms. *Adv Urol*. 2013;2013:752382.
13. Dellis AE, Papatsoris AG, Keeley FX Jr, Bamias A, Deliveliotis C, Skolarikos AA. Tamsulosin, solifenacin, and their combination for the treatment of stent-related symptoms: a randomized controlled study. *J Endourol*. 2017;31(1):100-9.
14. Hanna P, Fahmy MA, Hussein MM, El-Din AA. Prospective randomized study on the efficacy of tamsulosin, solifenacin, and their combination in relieving lower urinary tract symptoms in ureteric stent patients: insights from the brief-form Chinese USSQ. *World J Urol*. 2025;43(1):313.
15. Harahap DH, Adhyatma KP, Elbert E, Khosasi F, Warli M. Comparative efficacy of solifenacin and tamsulosin in alleviating stent-related symptoms: a systematic review and meta-analysis. *Narra J*. 2025;5(2):e1683.
16. Rameez M, Habib MU, Rahim J, Kazi A, Rahim J, Ahmed MZ. Comparison of monotherapy

tamsulosin or solifenacin alone versus combination therapy tamsulosin plus solifenacin in the management of JJ stent related urinary symptoms. *Pak J Med Health Sci*. 2024;18(1):226-29.

17. Khan FM, Memon WA, Ahmed A, Kumar R, Nadeem S, Kumar G. Comparative Efficacy of Tamsulosin and Solifenacin in Managing Double J Stent-Related Symptoms: A Randomized Clinical Study Using the USSQ Tool. *Journal of Liaquat National Hospital*. 2026. ; 4(1): 10-15.
18. Noor H, Khalid N, Sohail M. Treatment of lower urinary tract symptoms caused by double J stent with solifenacin and combination of tamsulosin plus solifenacin: A comparative study. *Journal of University Medical & Dental College*. 2018 Dec 6;9(4):19-24.
19. Javaid W, Akmal M, Sohail Z, Dastgir MB, Irshad RF. Comparison of Efficacy of Combination Therapy (Tamsulosin+ Solifenacin) Versus Monotherapy (Tamsulosin) Alone for Double J Stent Related Lower Urinary Tract Symptoms. *Indus Journal of Bioscience Research*. 2025 Jul 8;3(7):486-90.
20. Abbas G, Basharat MA, Sadia A, Khan AI, Javed MS, Munir MI. Comparison of tamsulosin with placebo in relieving ureteral stent related lower urinary tract symptoms. *Professional Med J* 2025; 32(08):1123-1127.