



## Effect of Tamsulosin versus Placebo in Females with Lower Urinary Tract Symptoms Less Than 40 Years of Age

Aman Ullah<sup>1</sup>, Badar Murtaza<sup>1</sup>, Haroon Sabir Khan<sup>1</sup>, Khan Muhammad<sup>1</sup>, Ajmal Khan<sup>1</sup>, Muhammad Tahir<sup>1</sup>

<sup>1</sup>Armed Forces Institute of Urology, Rawalpindi, Pakistan

### ARTICLE INFO

**Keywords:** Lower urinary tract symptoms, Tamsulosin, IPSS, alpha-blocker, women under 40, placebo-controlled trial.

**Correspondence to:** Aman Ullah, Armed Forces Institute of Urology, Rawalpindi, Pakistan  
Email: [amanhotak3@gmail.com](mailto:amanhotak3@gmail.com)

### Declaration

**Authors' Contribution:** All authors equally contributed to the study and approved the final manuscript.

**Conflict of Interest:** No conflict of interest.

**Funding:** No funding received by the authors.

### Article History

Received: 14-07-2025 Revised: 17-07-2025  
Accepted: 18-07-2025 Published: 20-07-2025

### ABSTRACT

**Introduction:** LUTS in women chronically affects the quality of life, and, to combat it, few treatment methods are available to women below the age of 40. Tamsulosin is an alpha-1 adrenergic blocker commonly used in men whereas young women with LUTS are under-studied. **Objective:** To compare the average response of International Prostate Symptom Score (IPSS) due to treatment using Tamsulosin and Placebo in females less than 40 years and with LUTS after 4 weeks of treatment. **Material and methods:** This was a prospective, comparative cross-sectional study done in AFIU, Rawalpindi from 12<sup>th</sup> April, 2025 to 12<sup>th</sup> July, 2025. One hundred and thirty six patients were randomly assigned to take Tamsulosin 0.4 mg or placebo daily once in a period of 4 weeks. The scores of IPSS before and after treatment were noted and compared. **Results:** The improvement of the IPSS was substantially superior in the Tamsulosin group (7.9 + 2.8) than in the placebo (2.4 + 2.5;  $p < 0.001$ ). It was a well-tolerated treatment. **Conclusion:** Tamsulosin is a safe and effective therapy of LUTS syndrome in young girls.

### INTRODUCTION

The main categories of lower urinary tract symptoms (LUTS) are categorised as storage, voiding and post-voiding, and women often have several complaints concurrently, like urinary urgency, frequency, nocturia and feeling of incomplete bladder emptying. These symptoms may have a dramatic effect both on the quality of life and on the risk of underdiagnosis, especially in younger women, who are likely to remain underdiagnosed because they have a false belief that LUTS may occur with a much higher degree of likelihood in older adults or among men (1). Although attacks of male LUTS have been studied in various studies and their management with pharmacologic therapy that includes alpha-blockers, the treatment of LUTS amongst women, specifically younger women, is scant and not as definitive (2). Tamsulosin is a very popular and well-documented therapy against LUTS in men with prostate enlargement (benign hyperplasia). Its effectiveness in treating obstructed urinary flow due to congested points in the smooth muscle at the neck of the bladder and prostate has influenced the potential application of its effects in women who experience such problems (3).

The biological nature of using Tamsulosin in female LUTS, even though the anatomy and pathophysiology of females' gender are different, is supported by alpha-1 adrenergic receptors in the bladder neck and urethra of females (4). However, most of the supporting evidence remains men-oriented and its use in women, especially younger generations, requires insights. Most of the trials that studied the effects of alpha-blockers, such as Tamsulosin, included old men or women with certain diseases like overactive bladder or urinary retention after surgery (5,6). Nevertheless, recent research indicates that Tamsulosin can be applied widely. A randomised study was performed to determine the role of Tamsulosin in avoiding post-operative urinary retention following blade placement, and a significant decrease in the retention level was measured. The drug's effectiveness in the management of women having an abdominal procedure and their bladder dynamics was also examined (6). Similarly, its use in preventing postoperative urinary retention after orthopaedic surgeries has recorded encouraging results (7). The evidence gives a platform on which to conjecture that it will be beneficial to use it in curing idiopathic or functional LUTS in younger women, even where surgery is not involved. More so, the

combination therapy with Tamsulosin has been investigated, especially among the male population having overactive bladder symptoms. Its combined use with Mirabegron was assessed as a result of a trial, such as the PLUS trial, which showed a higher symptomatic relief than monotherapy (4,8). The combination techniques highlight the possibility of Tamsulosin given additive or synergistic effects in complicated urological diseases, an insight that might be applied to female populations with combined LUTS phenotypes. Also, according to Johnson et al. (5), symptom response to Tamsulosin in men is voiding burden dependent, implying that a symptom profile should be done when placing patients under such medications. This can also be extrapolated to women, particularly those under 40 years, and should constitute an organised biomedical exploration.

Systematic reviews and meta-analyses have also been conducted on the potential usefulness of Tamsulosin in non-neurogenic LUTS in females. A meta-analysis study of Tamsulosin and alpha-blockers in general (2) found that they are capable of lowering the score on urinary symptoms scales and increasing the measures of urinary flow in women, but the results were heterogeneous and thus the conclusions could not be entirely generalised. These shortcomings highlight the necessity of randomised controlled trials based on homogeneous samples, such as the case of young adult females with idiopathic LUTS. Simultaneously, other existing interventions have been comparatively challenged against Tamsulosin in randomised trials of LUTS control, including those of traditional Thai massage. According to Sinsomboon et al., whereas traditional therapy was valid, Tamsulosin contributed to more and quicker alleviation of the symptoms (3). These results corroborate Tamsulosin as a first-line pharmacologic treatment of various LUTS causes. However, studies related to placebo-controlled trials are primarily focused on female LUTS. The absence of a strong control arm reduces the capacity to distinguish between actual pharmacologic efficacy and placebo effect that can be raised in symptom-based diseases (9,10). The recent literature also discussed the tolerability and safety of Tamsulosin among the non-male population. In another example, research on both ureteric stent patients and spine surgery patients found that Tamsulosin alleviated LUTS without the number of adverse events rising (10,9). This is a desirable safety aspect, and more so, in the younger women who may be wary of taking medication. Other agents like Silodosin have also been tested in women with LUTS, demonstrating their efficacy and tolerability. This supports the claim that alpha-blockers can be administered to this age group (11). Existing research has explored the use of alpha-blockers in extracorporeal shockwave lithotripsy of the stone by confirming that Tamsulosin is superior to other drugs like Tadalafil in enhancing the ureter stone clearance (12). These results strengthen the effectiveness of Tamsulosin in regulating lower urinary tract dynamics. It has also been suggested that combination drug therapies with alpha-blockers and 5-alpha-reductase inhibitors such as Dutasteride can produce symptomatic improvements in patients with benign prostatic enlargement, helpful in treating obstructive symptoms in women too (13,14).

Despite the fact that these methods are predominantly used in male patients, the mechanisms have provided insight to be able to treat similar symptoms in females with the drugs. Furthermore, the medicinal use of Tamsulosin has been studied amongst patients with foreign bodies like ureteric stents. A study by Sajid et al. observed that the combination of Solifenacin and Tamsulosin provided greater symptom relief than Solifenacin (15). Although this research has failed to present the isolated effect of Tamsulosin, it pointed out its utility in combination regimens.

There is also support towards the advantage of herbal alternatives like the red ginseng oil on male LUTS patients; pharmacologic treatment with Tamsulosin assumes a high-level clinical sensitivity in that respect because of pharmacodynamic establishment and dose specifications (16). Zhou et al. (17) have compiled meta-analyses focusing on state-of-the-science data in multiple trials that confirm this fact; Tamsulosin lowers the postoperative urinary retention states in the field of surgery. Although these studies are more male-dominated, they affirm the drug's usefulness in diverse urological malfunctions. Tamsulosin has also been funded according to clinical guidelines in other locations. In Hong Kong, it has incorporated it into individualised treatment algorithms for LUTS in polypharmacy-prone patients, indicating an even more promotional reach of clinical appearances (18). Finally, phase III studies are still going on that evaluate the cardiovascular safety of LUTS drugs, such as comparing Tamsulosin with other drugs such as Tadalafil, but results indicate that Tamsulosin remains a safe drug, and this is a mandatory predicate for young females with these pathologies (19).

Irrespective of this accumulating literature, the application of Tamsulosin in girls under 40 years old has not been thoroughly studied. Although the results of the separate studies point to positive changes among older women or patients with post-surgical indications, there is little information on their effectiveness compared to placebo in young women with idiopathic LUTS. The proposed study aims to fill this gap by running a placebo-controlled trial in this particular group of people, to establish the actual clinical benefit and safety of Tamsulosin and provide some evidence-based information about its safety and use in managing female LUTS.

### Objective

To compare the mean difference of Tamsulosin International Prostate Symptom Score (IPSS) and Placebo after 4 weeks of preparation in females less than or equal to 40 years of age with lower urinary tract symptoms.

### MATERIALS AND METHODS

**Study Design:** Prospective Comparative Cross-sectional study.

**Study Setting:** This research was carried out in Armed Forces Institute of Urology (AFIU) in Rawalpindi.

**Study duration:** The research covered a duration of three months, including 12<sup>th</sup> April, 2025 to 12<sup>th</sup> July, 2025.

**Inclusion criteria:** The inclusion criterion was female patients 18-40 years presenting with lower urinary tract symptoms (LUTS) of more than one month. Participants

could only be enrolled provided that they had an International Prostate Symptom Score (IPSS) of more than 8 and negative urine culture at start. Such criteria warranted the presence of symptomatic patients whose etiology of LUTS is non-infectious.

**Exclusion criteria:** The participants were excluded in case of pregnancy (confirmed on obstetric sonogram), history of stress urinary incontinence, neurogenic bladder, diabetes mellitus, multiple sclerosis or pelvic malignancy. To eliminate the potential confounders and bias, it was also excluded that some patients who had used alpha-blockers or antimuscarinic agents during the previous month or who had urinary bladder or lower ureteric stones (as confirmed by imaging).

## Methods

Study was conducted in AFIU, Rawalpindi after it was approved ethically by the Hospital Ethical Committee, and CPSP. Those female patients who visit the Urology Outpatient Department and are within the inclusion criteria were recruited through a consecutive non-probability technique. Specific informed consent was obtained and comprehensive clinical history enquired with special regards to lower urinary tract symptoms (LUTS). Laboratory examinations done revealed complete blood count, renal functions, urinalysis, and ultrasound of the abdomen and pelvis, as well as kidney, ureter, and bladder X-ray. The IPSS prior to treatment was documented. All of them were randomly selected to two groups, where Group A was treated with Tamsulosin 0.4 mg orally once a day during four weeks, and Group B got placebo on the same scheme. Following four weeks the patients were again re-evaluated and the IPSS was measured after treatment. The missing patients at follow-ups were replenished to cover the sample size. The primary investigator did all of the data collection.

## RESULTS

The 136 of all the female patients whose age was less than 40 years were put under Medical study, where 68 of the patients within each category (tamsulosin (Group A) and placebo (Group B)) were selected randomly. The two groups were also matched with regards to the baseline characteristics like age and the duration of symptoms. The age between means of Group A was 29.4 +/- 5.7 years whereas the age between means of Group B was 30.1 +/- 5.4 years. The mean time of symptoms occurrence was 7.2 +/- 1.8 weeks in the Tamsulosin group and 6.9 +/- 2.1 weeks in the placebo group. These were differences, which were not significant ( $p > 0.05$ ) and hence validates the baseline comparability.

**Table 1**

*Baseline Characteristics of Study Participants*

Variable	Tamsulosin Group (n = 68)	Placebo Group (n = 68)	p-value
Mean Age (years)	29.4 ± 5.7	30.1 ± 5.4	0.47
Duration of Symptoms (wks)	7.2 ± 1.8	6.9 ± 2.1	0.38
Pre-treatment IPSS	21.1 ± 4.3	20.9 ± 4.6	0.81

In Tamsulosin group, the mean International Prostate Symptom Score (IPSS) before treatment was 21.1 + 4.3, whereas, in the placebo group, it was 20.9 + 4.6. Post-

treatment IPSS in Tamsulosin group after 4 weeks had reduced to 13.2 3.9 and placebo group had a slight reduction of 18.5 4.2. The increase of IPSS was thus 7.9 2.8 in the Tamsulosin group and 2.4 2.5 in the placebo group.

**Table 2**

*Comparison of IPSS Scores Before and After Treatment*

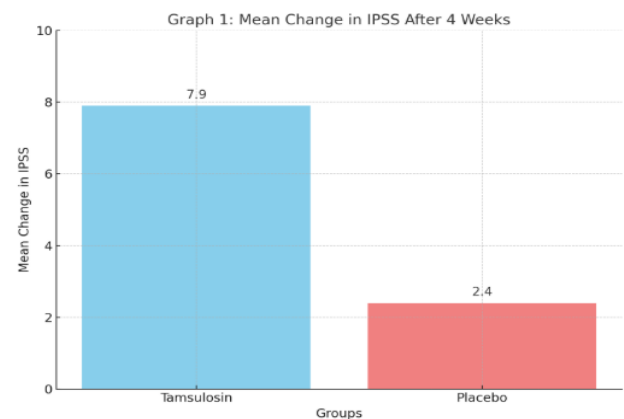
Group	Pre-treatment IPSS	Post-treatment IPSS	Mean Change in IPSS	p-value
Tamsulosin	21.1 ± 4.3	13.2 ± 3.9	7.9 ± 2.8	< 0.001*
Placebo	20.9 ± 4.6	18.5 ± 4.2	2.4 ± 2.5	0.001*

\*Statistically significant

This comparison in the mean of change improvement in IPSS of the two groups was statistically significant as evidenced on an unpaired use of t-test test ( $p < 0.001$ ) thus proving that Tamsulosin seemed to be more effective in enhancing the lower urinary tract symptoms in females below 40.

**Graph 1**

*Mean Change in IPSS after 4 Weeks*



The statistics on stratification by age bracket (18-30 years and 31-40 years) showed the constant tendency among the age groups. Moderate decrease of IPSS was 8.1 +/- 2.6 with Tamsulosin and 2.5 +/- 2.7 with placebo in younger group (18-30). The group of older age (31-40) showed an average difference in IPSS 7.7 +/- 3.0 and 2.3 +/- 2.4 respectively and it was also statistically significant.

**Table 3**

*Stratified Analysis of Mean IPSS Change by Age Group*

Age Group	Tamsulosin Group (Mean ± SD)	Placebo Group (Mean ± SD)	p-value
18-30 years	8.1 ± 2.6	2.5 ± 2.7	< 0.001*
31-40 years	7.7 ± 3.0	2.3 ± 2.4	< 0.001*

Moreover, the two groups did not record any serious side effects. Two of the patients using Tamsulosin complained of minor form of dizziness and nasal stuffiness, though the drug was not to be discontinued. In general, the findings showed that Tamsulosin had significant effects on LUTS among females aged below 40 relative to placebo. Symptom improvements were also homogeneous among age subgroups and reported a positive safety profile.

## DISCUSSION

This study sought to determine how effective Tamsulosin is as a medication compared to those who are put under placebo among females under 40 years of age and with

lower urinary tract symptoms (LUTS). The results demonstrated statistically significantly better effects on International Prostate Symptom Score (IPSS) of alpha-blocker therapy Tamsulosin in 4 weeks treatment group compared to the placebo group, which showed significant therapeutic effect of alpha-blocker treatment in young women with non-neurogenic LUTS. Even though the alpha-blockers such as Tamsulosin are usually used to treat male patients who have benign prostatic hyperplasia (BPH), increased evidence confirms their adoption in some specific classes of females. This gives a corresponding result with reports conducted by Kang et al. who through systematic review and meta-analysis, proved that alpha-blockers significantly enhanced symptom scores and flow parameters amid women with LUTS (2). In addition, our findings confirm their results, which means that one more point can be estimated to support the usage of Tamsulosin in this population segment.

Notably, our study was statistically significant and clinically important because the mean improvement of IPSS in our Tamsulosin group was over tripled compared to that of the placebo group. Another finding that was affirmed in the study is that Tamsulosin was well-tolerated by young females with no significant adverse event reported. It was reported to have some mild effects like dizziness and congestion of the nose, although these effects did not demand termination. These findings go together with safety data in previous trials in male populations (1), and with those trials where Tamsulosin use was assessed in females to prevent postoperative urinary retention (6). Interestingly, the research contributes to a scarce number of placebo-controlled trials which only involved female LUTS patients who were under 40 years old. However, previous studies like the one by Pummangura et al. compared Tamsulosin, and it was compared to placebo in a female sample, but their research relied on fewer subjects and extended age groups (8).

Thanks to a highly specific and poorly represented in studies population, the current study serves as a more convincing demonstration of a positive effect in a group of young women aged 20-40, thus eliminating a significant research gap in the field of pharmacotherapy of urological patients. Age stratification (1830 and 3140 years of age) analysis conducted in our research demonstrated that Tamsulosin treatment was similarly effective in both age groups, which indicates that the use of the drug does not vary in this young adult age range. These findings give voice to the results achieved in the male population in terms of Tamsulosin finding its use in diverse age groups and symptom loads (5). The etiology of LUTS in young women however, unlike in men where they are usually of rather anatomical etiology (e.g. prostate enlargement), is more usually functional or idiopathic. This disparity has an important implication to our results as tamsulosin seems to have a positive effect even in the absence of an obvious anatomical blockage probably because of its actions on smooth muscle in the bladder neck and urethra (4).

The mechanism of action of tamsulosin that is, selective inhibition of alpha-1 adrenergic receptors, causes a reduction of urethral resistance and enhanced bladder emptying. In women they are mostly concentrated on the bladder neck and proximal urethra. The observed

response in this study is a confirmation to the fact that, in spite of the differences in their anatomy, physiological impact of alpha-blockade can be fully utilized in the two sexes. Its symptom-soothing effect in women was also supported by previous studies like the one by Sinsomboon et al., which compared Tamsulosin with the Thai traditional massage (3). Though it might be possible to treat it via other means, drug treatment using alpha-blockers can be more efficient and has a more prominent effect in a shorter time. Moreover, Tamsulosin is investigated as combined with other drugs Mirabegron or Solifenacin particularly in the cases of overactive bladder symptoms or stent-related symptoms (4). Although, this study dealt with a monotherapy, its observation may possibly lead to combination therapy studies in women with mixed symptomatology. According to these possibilities, Wee et al. tested Silodosin, an alpha-blocker in females and indicated their good safety and efficacy, and the implications behind it, where our results can be applied to other drugs with the same effects (11).

Regarding the methodology, we were strict in the stickiness of homogeneity in the sample. There were strict criteria of inclusion and exclusion which minimize the possibility of confounding by neurogenic causes, urinary tract infections, or urological malignancies. The evaluation of treatment response with the help of a standardized symptom score instrument (IPSS) was a reliable approach with a quantitative measurement. The study is comparable to that done in earlier research in males and in postmenopausal females and adds the necessary comparison between gender and age groups (6,7). In our study, the placebo group did not demonstrate the significant decrease in IPSS, which was partially caused by the psychological effect of enrollment in the clinical trial or by the natural swing in the symptoms. However, the progress of the Tamsulosin group was much higher, which proves a genuine pharmacologic effect. These placebo-reactions are well known in other LUTS trials, which makes placebo controlled ones in urology even more important (9).

Although this research has strength on its side, there are limitations that should be mentioned. The 4 weeks of follow-up time is not long enough to reflect long-term results or late complications. Also, though IPSS is validated and popularly applied, it was initially developed in male patients with BPH. Although both sexes can apply to this study, other researchers believe that the future investigation should use more female-based measurement tools (18). Additionally, we failed to integrate additional elements, such as urodynamic examinations and post-void residual evaluation, which might have allowed gaining more information on physiological alterations. However, past male and female studies signify that the improvement of symptoms is usually associated with an enhancement in the flow dynamics and action of the bladder (17). Finally, positive safety profile, which was reported in the present study, is consistent with the literature at large, including studies of the cardiovascular safety of Tamsulosin, specifically the lack of connection with major adverse cardiac events or venous thromboembolism, as demonstrated by Goberdhan et al. (19). This is of particular concern in young women with long-term safety

being a factor to be considered in assigning of long term medicines.

## CONCLUSION

The results of the research study prove that Tamsulosin is strongly effective compared to placebo in the enhancement of lower urinary tract symptoms (LUTS) among females below 40 years old age. The effect of Tamsulosin on International Prostate Symptom Score (IPSS) was reported to effectively reduce the IPSS four weeks after treatment in comparison to the placebo group with no significant difference in the age subsets. The

treatment was tolerated and its side effects were minor and non self limiting. These findings show how alpha-blockers can be used as a treatment in young females with non-neurogenic LUTS, who have long been underrepresented in the setting of urological pharmacologic studies. The study aims to fill one of the major evidence gaps with a randomized, placebo-controlled design and thus further support the decision to introduce Tamsulosin as a safe and effective symptomatic treatment of this population. Additional long-term studies are suggested to confirm these results and determine their long-term efficacy and no adverse events after the original retention period.

## REFERENCES

- Lee AW, Kenfield SA, Wang EY, Enriquez A, Oni-Orisan A, Steinman MA, Sim I, Breyer BN, Bauer SR. Tracking lower urinary tract symptoms and tamsulosin side effects among older men using a mobile app (PERSONAL): feasibility and usability study. *JMIR Formative Research*. 2021 Dec 10;5(12):e30762. <https://doi.org/10.2196/30762>
- Kang TW, Kim SJ, Chang KD, Kim MH, Chung HC. Effect of symptom-based alpha-blocker treatment on lower urinary tract symptoms in women: systematic review and meta-analysis. *Therapeutic advances in urology*. 2021 Oct;13:17562872211053679. <https://doi.org/10.1177/17562872211053679>
- Sinsomboon O, Noppakulsatit P, Tassanarong A, Tungskruthai P, Sriyakul K. A comparison of effectiveness of Thai traditional massage and Tamsulosin in lower urinary tract symptoms: a randomized controlled trial. *Journal of evidence-based integrative medicine*. 2022 Jan;27:2515690X211068825. <https://doi.org/10.1177/2515690x211068825>
- Herschorn S, McVary KT, Santos JC, Foley S, Kristy RM, Choudhury N, Hairston J, Kaplan SA. Mirabegron vs placebo add-on therapy in men with overactive bladder symptoms receiving tamsulosin for underlying benign prostatic hyperplasia: a safety analysis from the randomized, phase 4 PLUS study. *Urology*. 2021 Jan 1;147:235-42. <https://doi.org/10.1016/j.urology.2020.09.040>
- Johnson II TM, Goode PS, Hammontree L, Markland AD, Vaughan CP, Ouslander JG, Falk K, McGwin Jr G, Burgio KL. An exploratory analysis of tamsulosin for overactive bladder (OAB) in men with varying voiding symptom burden. *Urology*. 2021 Jul 1;153:42-8. <https://doi.org/10.1016/j.urology.2021.01.022>
- Leffelman A, Chill H, Paya-Ten C, Hadizadeh A, Lee J, Chang C, Rostaminia G. Effect of preoperative tamsulosin on postoperative urinary retention prevention after sling placement: a randomized controlled trial. *International Urogynecology Journal*. 2025 Apr 12:1-9. <https://doi.org/10.1007/s00192-025-06120-2>
- Choi CI, Kim JK, Choo MS, Lee SH, Chang JD, Han JH. Preventive effects of tamsulosin for postoperative urinary retention after lower limb arthroplasty: a randomized controlled study. *Investigative and clinical urology*. 2021 Aug 3;62(5):569. <https://doi.org/10.4111/icu.20200523>
- Wu Y, Li G, Zhou H, Wu A, Tan G, Huang S, Chen G, Chen X, Li Z. Mirabegron add-on tamsulosin for men with overactive bladder symptoms: a pooled analysis of four randomized controlled trials. *Urologia Internationalis*. 2024 Apr 2;108(2):118-27. <https://doi.org/10.1159/000536110>
- Rughani A, Cushing D, Lary CW, Cox S, Jumper B, Johnson N, Florman J. Does tamsulosin decrease postoperative urinary retention in spine surgery? A double-blind, randomized controlled trial. *Journal of neurosurgery*. 2022 Feb 11;137(4):1172-9. <https://doi.org/10.3171/2021.10.jns.212393>
- 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 Journal of Urology*. 2025 May 16;43(1):313. <https://doi.org/10.1007/s00345-025-05695-1>
- Wee CB, Kim TH, Tae JH, Choi SY. Efficacy and Safety of Silodosin for the Treatment of Female LUTS: A 12-Week Prospective, Single-Center Study. *LUTS: Lower Urinary Tract Symptoms*. 2025 Jan;17(1):e70005. <https://doi.org/10.1111/luts.70005>
- Falahatkar S, Akhavan A, Esmaeili S, Amin A, Kazemnezhad E, Jafari A. Efficacy of tamsulosin versus tadalafil as medical expulsive therapy on stone expulsion in patients with distal ureteral stones: A randomized double-blind clinical trial. *International braz j urol*. 2021 Jul 30;47(5):982-8. <https://doi.org/10.1590/s1677-5538.ijbu.2020.1007>
- Abou-Farha M, Hagraas A, Nagla S. Effect of dose reduction of dutasteride in combination with alpha-blockers in patients with lower urinary tract symptoms/benign prostatic enlargement. *Urology Annals*. 2024 Apr 1;16(2):120-4. <https://doi.org/10.4103/ua.ua.15.22>
- Mari A, Antonelli A, Cindolo L, Fusco F, Minervini A, De Nunzio C. Alfuzosin for the medical treatment of benign prostatic hyperplasia and lower urinary tract symptoms: A systematic review of the literature and narrative synthesis. *Therapeutic advances in urology*. 2021 Apr;13:1756287221993283. <https://doi.org/10.1177/1756287221993283>
- Sajid MT, Rehman SU, Akmal M, Hussain A, Mirza ZI, Mahmood A. Comparison Of Solifenacin Versus Combination Of Solifenacin And Tamsulosin In Improving Unilateral Double-J Stent Related Lower Urinary Tract Symptoms. *Pakistan Armed Forces Medical Journal*. 2021 Feb 28(1):45. <https://doi.org/10.51253/pafmj.v71i1.2617>
- Shin D, Yoon BI, Bang S, Bae WJ, Ha US, Kim S, Piao J, Kim JH, Koo GB, Jeon KH, Kim TH. Safety and Efficacy assessment of red ginseng oil (rxgin) in men with lower urinary tract symptoms in a randomized, double-blind, placebo-controlled trial. *The World Journal of Men's Health*. 2023 Aug 29;42(1):229. <https://doi.org/10.5534/wjmh.230172>
- Zhou Z, Gan W, Li Z, Li Z, Zhou F, Li H, Liu Z. Can prophylactic tamsulosin reduce the risk of urinary retention after surgery? A systematic review and meta-analysis of

- randomized control trials. International Journal of Surgery. 2023 Mar 1;109(3):438-48.  
<https://doi.org/10.1097/js9.0000000000000267>
18. Chu PS, Leung CL, Cheung MH, Woo SW, Lo TK, Chan TN, Wong WK. Hong Kong Geriatrics Society and Hong Kong Urological Association consensus on personalised management of male lower urinary tract symptoms in the era of multiple co-morbidities and polypharmacy. Hong Kong Medical Journal. 2021 Apr 1;27(2):127.  
<https://doi.org/10.12809/hkmj209049>
19. Goberdhan S, Blachman-Braun R, Nackeeran S, Masterson 3rd TA, Ramasamy R. Is tadalafil associated with decreased risk of major adverse cardiac events or venous thromboembolism in men with lower urinary tract symptoms?. World journal of urology. 2022 Jul;40(7):1799-803.  
<https://doi.org/10.1007/s00345-022-04005-3>