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Effect of Tamsulosin in Prevention of Postoperative Urinary Retention

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ABSTRACT

Tamsulosin has shown effectiveness in the treatment of lower urinary tract symptoms, especially post-operative urinary retention (POUR). **Objectives:** To assess the efficacy of tamsulosin in the prevention of POUR and to determine the relationship between POUR incidence and urinary parameters such as urine pH, specific gravity, and color. **Methods:** This cohort (longitudinal) research was carried out at the Department of Urology, Liaquat University of Health Sciences, Jamshoro, for 6 months (from January 2025 to June 2025) after approval from the IRB. Data collection included baseline demographics, comorbidities, and pre-operative information. At 6, 12, and 24 hours post-operative post-void residual (PVR) was assessed. Analysis of urine was done for measuring urinary pH, color, and specific gravity. SPSS was used for analyzing the data, keeping $p<0.05$ statistically significant. **Results:** From 150 post-operative cases, the mean age was 53.5 ± 11.3 years, with around 71 % male. Tamsolusin substantially decreased POUR with a reduction in PVR from 186 ml (6 hours) to 82 ml (24 hours). Incidence of POUR reduced from 24.7 % to 6 %. Cases having POUR showed lower pH of urine, high specific gravity, and dark colored urine. **Conclusions:** The present study demonstrated that tamsulosin was effective in preventing postoperative urinary retention (POUR) by significantly reducing post-void residual volumes and improving urinary flow within the first 24 hours after surgery.

INTRODUCTION

Post-Operative Urinary Retention (POUR) is defined as the inability to completely or spontaneously void post-operatively [1]. Around 69 % of operations are complicated by it, and so it has substantial consequences for the patients. POUR causes discomfort to patients in general, coupled with embarrassment [2]. Cambise et al. reported in their study that the incidence of POUR post-various surgeries ranged as low as 3 % to as high as 70 %. Due to bladder distention, hemodynamic shifts take place along with prolonged dysfunction of the detrusor muscle and the possibility of injuries to the kidneys [3]. Moreover, managing POUR requires using urinary catheters for emptying the bladder. This causes risk for catheter-associated infection of the urinary tract (CAUTI) [4]. Amongst the most commonly reported infections in hospital settings, urinary tract infections (UTI) top the list, in which 70 to 80 % are attributed to an indwelling urinary catheter (IUC) [5]. Duration of catheterization is one of the most important predictors of CAUTI. It is estimated that around 4-7 % risk of causing bacteriuria increases with each day of use of IUC [6]. One of the most important factors in the management of CAUTI is the removal of the catheter as early as possible. Nonetheless, if catheters are removed early in post-operative patients, it has been linked with higher POUR incidences and needing re-catheterization [7]. Therefore, for facilitating early removal of the catheter without risking reinsertion of the catheter, efforts must be targeted at preventing POUR. One of the factors leading to POUR is thought to be the use of anesthetics that cause suppression of micturition control

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and reflex. However, the etiology of POUR is hypothesized to be multifactorial, and sympathetic stimulations due to surgery and pain are thought to play a vital part [8]. A selective alpha-1a antagonist of adrenoceptors, known as Tamsulosin, has shown effectiveness in the treatment of lower urinary tract symptoms, especially in male having benign prostatic hyperplasia [9]. Moreover, it is regarded as a well-tolerated and safe medication with few adverse effects, especially cardiovascular ones, as compared to other less-selective alpha blocking agents. Tamsulosin tends to relax smooth muscles present in the urethral sphincter, neck of the bladder, and the prostate. This leads to relief from symptoms of the urinary tract [10]. Even though tamsulosin is approved for use in male having BPH by the FDA (Food and Drug Administration), its role is also being explored for relief of symptoms or lower urinary tract symptoms in female as well, with successful results. Off-label, it is used clinically for treating POUR in patients having voiding difficulties [11]. In recent times, researchers have studied the use of tamsulosin in the prevention of POUR in a limited number of surgical cases, demonstrating mixed results [12]. A study by Baysden *et al.* showed no positive effect of administering tamsulosin at 0.2 mg post-operatively for 7 days in the prevention of POUR post-surgery of rectal cancer patients [13]. On the contrary, a couple of randomized controlled trials that involved male patients undergoing elective repair of inguinal hernia and other benign urological surgeries showed a positive tamsulosin effect when administered pre-operatively [14, 15]. Therefore, even though the published literature suggests a beneficial role of tamsulosin therapeutically in preventing POUR, its efficacy on a broader number of surgical cases undergoing abdominal surgeries is still unclear. Therefore, this study was carried out to assess the effectiveness of tamsulosin in preventing post-operative urinary retention in patients undergoing ureteroenoscopy by evaluating urine pH, specific gravity, and color. For enhancing the statistical outcome of the research, urine pH, specific gravity, and color were assessed. The typical range of urine pH is from 4.5 to 8, having much fluctuation post-operatively due to medications, anesthesia, and changes in metabolic activity. Any acute kidney injury can lead to a more acidic pH of urine both pre- and post-operatively. In contrast, a urinary pH of over 8.0 might point towards urinary tract infection (UTI), whilst a pH below 4.5 denotes either dehydration or metabolic acidosis [16]. The specific gravity of urine normally is between 1.002 and 1.035, reflecting hydration status and functioning of the kidneys. Research has shown that around half of surgical patients receiving I/V fluid intra-operatively tend to have low specific gravities (<1.010), while in around 10 to 20 % of cases, due to kidney dysfunction or dehydration, higher specific gravities (>1.030) are observed post-operatively [17]. Normally, the post-operative color of urine varies from pale yellow to deep amber, with transient hematuria presenting in about 15 % of cases. This occurs especially after abdominal or urological procedures. Due to hydration, some post-operative patients experience dark colored urine, whilst excess administration of I/V fluids causes diluted urine, indicating impairment of the kidneys [18].

There is limited evidence for post-operative renal function parameters, hydration status, associated complications, and the use of tamsulosin for preventing POUR, especially in the local population, which is a significant area of research that has been overlooked. There is a lack of robust data to understand the outcomes of surgery and the impact of preventative interventions for POUR in surgical patients. This study aimed to measure post-operative renal function parameters and hydration status, identify associated complications, and determine the efficacy of tamsulosin in preventing postoperative urinary retention (POUR).

METHODS

This longitudinal cohort study using consecutive sampling was done at the Department of Urology of Liaquat University of Health Sciences, Jamshoro. The duration of study was six months post- IRB approval of the research proposal (from January 2025 to June 2025). For the calculation of sample size, open epi online software tool was used. Keeping the prevalence of POUR at 9.9 % as reported in a study on the risk factors for post-operative retention of urine in post-surgical cases. Keeping the confidence level at 95 %, the frequency of cases developing retention of urine at 9.9 %, the sample size came out to be 150 [19]. Therefore, a total of 150 cases were included. Surgical cases of the Department of Urology between the ages of 18 and 65 years, of both genders, and undergoing ureteroenoscopy, wherein POUR was a known risk factor, were included in the study. Moreover, patients having normal pre-operative function of bladder, as recorded in the history of patients (from medical records), like the color of urine, its pH, and specific gravity, were noted. A urine pH between 4.5 and 8.0, color within the normal range, and specific gravity between 1.005 and 1.030 were included. Breastfeeding or pregnant female were excluded, in addition to patients with any systemic disease of neurological, renal, cardiovascular, or hepatic variety, and those having known contraindications to tamsulosin, similar alpha-1 blockers, or allergy were also excluded. After ethical approval from IRB with ref: LUMS/REC/-558, a self-designed questionnaire was employed for recording the baseline demographic data of patients, for instance, gender, age, pre-existing disease/s, and other medical and surgical history. Data collection was carried out in a total of 3 phases, viz. pre-operative, pre-operative and post-

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operative. In the pre-operative phase, patients eligible for the study were screened on the basis of medical records and then enrolled according to inclusion and exclusion criteria after taking informed consent from each patient. Baseline demographics and pre-operative variables included pH of urine, its specific gravity, and color as well. For urine analysis, mid-stream clean catch urine sample/s were analyzed for pH using either test strips or a calibrated pH meter, specific gravity by dipstick urinalysis or refractometer, and color was assessed through visual aid using a standardized chart for urine color. Pre-operatively, all patients received 0.4 mg tamsulosin the night before the surgical procedure and were continued post-operatively for 7 days. Operative anesthesia and surgical procedure details were recorded. A urologist of at least five years of experience at the urology department of the hospital performed all surgeries. Post-operatively, the patients were monitored for POUR, urinary pH, color, and specific gravity. Other than these, post-operatively, patients were also monitored for any urinary tract infection, dysuria, hematuria, and any complication associated with the catheter, i.e., discomfort, infection, or trauma to the urethra. Samples of urine for analysis were collected on days 1st, 3rd, and 7th after the surgery. Such a systemic approach ensured accuracy in the collection of data for evaluation of tamsulosin's effectiveness in the prevention of POUR and its effect on parameters of urine, whilst addressing its potential regarding post-operative complications for optimum care of the patient. Belmont report for human guidelines for research was followed. Informed consent and the study's purpose were communicated to each patient before inclusion in the study, with the option of refusal to participate in the study at any given point in time. All data was kept confidential and anonymous.

SPSS version 27.0 was used to analyze the data. Descriptive statistics were used to find the baseline demographic and clinical characteristics; continuous variables, including age and duration of surgery, were described in mean along with standard deviation, whereas skewed variables, including intra-operative fluid volume, post-void residual (PVR), time to first void, and length of hospital stay, were summarized in median with inter-quartile range. Frequencies and percentages were used to show categorical variables such as gender, comorbidities, ASA class, postoperative urinary retention (POUR), urine color, need for catheterization, urinary tract infection, and readmission. The tests of quantitative variables were the Shapiro-Wilk test used to determine whether the variables were normal. An independent sample t-test was used to compare the normally distributed variables (urine pH and specific gravity) of patients with and without POUR. The chi-square test was used to test the association of categorical variables, especially the urine color and POUR status. All the statistical tests were two-tailed, and a p-value below 0.005 was deemed to be significant.

RESULTS

A total of 150 patients were included in the study. Overall, the mean age of included patients was 53.47 ± 11.3 years. A total of 107 (71.33%) male and 43 (28.67%) female were included in the research. 67 (44.67 %) patients were hypertensive, 71 (47.33%) were diabetic, 77 (51.33%) had Benign Prostatic Hyperplasia (BPH), while 31 (20.67%) had cardiac disease. Around 81 (54%) cases were ASA class III-IV. Mean duration of surgery was 64.75 ± 10.2 mins, while median intra-operative fluid was 1237 ± 282 ml (Table 1).

Table 1: Baseline Demographics of Included Patients (n=150)

Variables		n (%), Mean ± SD
Mean Age ± SD (years)		53.47 ± 11.3
Gender	Male	107 (71.33%)
	Female	43 (28.67%)
Co-morbidities	Hypertension	67 (44.67%)
	Diabetes Mellitus	71 (47.33%)
	Benign Prostatic Hyperplasia (BPH)	77 (51.33%)
	Cardiac Disease	31 (20.67%)
ASA class III-IV		81 (54%)
Mean Duration of Surgery (mins)		64.75 ± 10.2
Median Intra-operative Fluid (ml)		1237 ± 282

At 6, 12, and 24 hours post-operatively, the median PVR was 186 ml (111-265), 131 ml (83-210), and 82 ml (52-112), respectively. The rate of POUR at 6 hours, 12 hours, and 24 hours was 37 (24.67%), 26 (17.33%), and 09 (6%), respectively. Post-operatively, 59 (39.33%) required catheterization. The occurrence of UTI within 7 days occurred in 10 (6.67%) cases, while readmission within 30 days was observed in 03 (2%) of cases. The post-operative outcomes and measures of urinary retention are presented (Table 2).

Table 2: Post-Operative Outcomes and Measures of Urinary Retention (n=150)

Outcomes	Values
Median PVR 6 h (IQR) ml	186 (111–265)
Median PVR 12 h (IQR) ml	131 (83-210)
Median PVR 24 h (IQR) ml	82 (52-112)
POUR Rate 6 h (%)	37 (24.67%)
POUR Rate 12 h (%)	26 (17.33%)
POUR Rate 24 h (%)	9 (6%)
Catheterization Required, n (%)	59 (39.33%)
Time to First Void (hrs), Median (IQR)	5.4 (3.9-10.8)
Length of Stay (days), Median (IQR)	2.4 (1.6-3.8)
UTI within 7 Days, n (%)	10 (6.67%)
Readmission within 30 Days, n (%)	3 (2%)

In cases with POUR, the mean pH of urine was 5.9 ± 0.9, while in patients without POUR, the mean urine pH was 6.3 ±

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0.8, with a significant difference of p-0.020. The specific gravity of patients with POUR was 1.026 ± 0.005, while in patients without POUR, the mean specific gravity was 1.021 ± 0.002 with a significant difference of p-0.010. A highly significant difference of p<0.001 was reported in terms of the color of urine in patients with POUR and without POUR (Table 3).

Table 3: Comparison of Post-operative Urinary Retention (POUR) according to Urine Parameters (n=150)

Variables		POUR Present, n=72	POUR Absent, n=78	p-value
Urine pH (Mean ± SD)		5.9 ± 0.9	6.3 ± 0.8	0.020
Specific Gravity (Mean ± SD)		1.026 ± 0.005	1.021 ± 0.002	0.010
Urine Color	Light Yellow	31 (43.1%)	39 (50%)	<0.001
	Amber	28 (38.89%)	32 (41.03%)	
	Dark Yellow	13 (18.1%)	07 (8.97%)	

DISCUSSION

In this study of 150 postoperative patients, the mean age was 53.47 ± 11.3 years, with a predominance of male (71.3%) and common comorbidities including diabetes (47.3%), hypertension (44.7%), and benign prostatic hyperplasia (51.3%). The mean operative duration was 64.8 minutes, and most patients were in ASA class III–IV (54%). Postoperatively, a marked reduction in post-void residual (PVR) was observed from 186 ml at 6 hours to 82 ml at 24 hours, with a corresponding decline in POUR incidence from 24.7% to 6%, demonstrating the effectiveness of tamsulosin in preventing urinary retention. Catheterization was required in 39.3%, the median time to first void was 5.4 hours, and the median hospital stay was 2.4 days, with minimal complications. Patients with POUR exhibited lower urine pH (5.9 ± 0.9), higher specific gravity (1.026 ± 0.005), and darker urine color, compared to those without retention (p<0.005), suggesting that acidic and concentrated urine profiles may correlate with a higher risk of POUR. Similar to the findings of this research, a systematic review and meta-analysis aimed at estimating the efficacy of prophylactic Tamsulosin on post-operative urinary retention (POUR) amongst male patients. The pool of 11 studies, including 1046 patients administered tamsulosin, while 1,113 controls reported significantly lower rates of POUR in the tamsulosin group, i.e., in 123 (11.8%) versus in 238 (19%) of patients in the control group (p-0.006). However, the research observed that the use of tamsulosin resulted higher risk of adverse reaction. The research concluded that prophylactic use of Tamsolusin helps in the prevention of POUR, especially among younger patients. However, the advantages must outweigh the possible adverse effects associated with its use. In most cases, the adverse events are self-limited [18]. Although in our study, adverse effects were not generally reported, the use of Tamsolusin was, in most cases, observed with no or minimal side effects. In line with the findings of our study, research done to evaluate Tamsolusin's efficacy when administered pre-operatively for preventing POUR reported to be effective in the reduction of POUR's incidence in patients who underwent elective abdominal surgery. On the contrary, Papageorge *et al.* in their study on 158 participants observed that perioperative prophylaxis using Tamsolusin was not effective in decreasing the prevalence of POUR in elective abdominal surgery cases [19]. In another study by Gao *et al.* on comparison of prophylactic effects of tamsulosin with placebo on POUR observed that from 232 male patients included in the study, POUR was observed in 5.9 % given tamsulosin, while in 21.1 % of patients given placebo for urinary retention (p-0.001). The study observed no adverse effect with the use of tamsulosin or a placebo. The study concluded that short pre-operative treatment with tamsulosin can aid in reducing incidences of urinary retention and need for catheterization post- urological surgeries [20]. This study utilized a well-defined postoperative cohort with standardized timing of urine assessments at multiple intervals, allowing objective evaluation of tamsulosin's effectiveness. The inclusion of urine biochemical parameters (pH, specific gravity, and color) provided novel insights into physiological factors influencing postoperative urinary retention. Statistical rigor, including repeated measures and post-hoc analyses, strengthened the validity of findings.

This single-center study with a relatively small sample size and absence of a randomized control group may limit the generalizability and causal interpretation of the findings. Future multicenter randomized controlled trials with larger and more diverse populations are warranted to confirm these results, determine optimal timing and dosage of tamsulosin, and evaluate long-term safety, patient-reported outcomes, and the predictive role of urine biochemical parameters in postoperative urinary retention.

CONCLUSIONS

The present study demonstrated that tamsulosin was effective in preventing postoperative urinary retention (POUR) by significantly reducing post-void residual volumes and improving urinary flow within the first 24 hours after surgery. Its prophylactic use appears particularly beneficial in patients at higher risk, such as male and those with benign prostatic hyperplasia. Furthermore, urine characteristics- specifically lower pH, higher specific gravity, and darker coloration were associated with an increased likelihood of POUR, suggesting a link between hydration status and postoperative bladder function. These findings support the use of tamsulosin as a safe and effective pharmacologic strategy to minimize POUR and emphasize the importance of maintaining adequate hydration in the perioperative period.

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Authors' Contribution

Conceptualization: FB, JA
Methodology: FB, I, IA
Formal analysis: MA, JA, MA, MA
Writing and Drafting: FB, JA, MA
Review and Editing: FB, JA, I. IA, MA, MA

All authors approved the final manuscript and take responsibility for the integrity of the work

Conflicts of Interest

All the authors declare no conflict of interest.

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REFERENCES

[1] McDermott CD, Tunitsky-Bitton E, Dueñas-Garcia OF, Willis-Gray MG, Cadish LA, Edenfield A *et al.* Postoperative Urinary Retention. Urogynecology. 2023 Apr; 29(4): 381-396. doi: 10.1097/SPV.0000000000001344.

[2] Yaban ZŞ and Karaöz S. Postoperative Urinary Retention: Risk Factors. Abant Medical Journal. 2021; 10(1): 169-177. doi: 10.47493/abantmedj.2021.48.

[3] Cambise C, De Cicco R, Luca E, Punzo G, Di Franco V, Dottarelli A *et al.* Postoperative Urinary Retention: A Narrative Review. Saudi Journal of Anaesthesia. 2024 Apr; 18(2): 265-271. doi: 10.4103/sja.sja_88_24.

[4] Rubi H, Mudey G, Kunjalwar R. Catheter-Associated Urinary Tract Infection. Cureus. 2022 Oct; 14(10): 1-6. doi: 10.7759/cureus.30385.

[5] Hernandez M, King A, Stewart L. Catheter-Associated Urinary Tract Infection Prevention and Nurses' Checklist Documentation of Their Indwelling Catheter Management Practices. Nursing Praxis in New Zealand. 2019 Mar; 35(1).

[6] Yu S, Marshall AP, Li J, Lin F. Interventions and Strategies to Prevent Catheter-Associated Urinary Tract Infections with Short-Term Indwelling Urinary Catheters in Hospitalized Patients: An Integrative Review. International Journal of Nursing Practice. 2020 Jun; 26(3): 1-32. doi: 10.1111/ijn.12834.

[7] Nollen JM, Pijnappel L, Schoones JW, Peul WC, Van Furth WR, Brunsveld-Reinders AH. Impact of Early Postoperative Indwelling Urinary Catheter Removal: A Systematic Review. Journal of Clinical Nursing. 2023 May; 32(10): 2155-2177. doi: 10.1111/jocn.16393.

[8] Baldini G, Bagry H, Aprikian A, Carli F, Warner DS, Warner MA. Postoperative Urinary Retention: Anesthetic and Perioperative Considerations. Anesthesiology. 2009 May; 110(5): 1139-1157. doi: 10.1097/ALN.0b013e31819f7aea.

[9] Foster RT Jr, Borawski KM, South MM, Weidner AC, Amundsen CL. Tamsulosin to Prevent Postoperative Urinary Retention After Female Pelvic Reconstructive Surgery: A Randomized Controlled Trial. Obstet Gynecol. 2021; 137(3): 455-462. doi:10.1097/AOG.0000000000004267.

[10] Khani Y, Bagheri AB, Maghsoudi M, Shirzadi A, Ahmadinejad M. Potential Risk Factors and the Effect of Tamsulosin on Postoperative Urinary Retention in Patients Undergoing Anorectal Surgery: A Cross-Sectional Study. Asian Journal of Health Sciences. 2023 Jun; 9(1): 1-11.

[11] Zhou Z, Cui Y, Wu J, Ding R, Cai T, Gao Z. Meta-Analysis of the Efficacy and Safety of the Combination of Tamsulosin Plus Dutasteride Compared with Tamsulosin Monotherapy in Treating Benign Prostatic Hyperplasia. BioMed Central Urology. 2019 Mar; 19(1): 17. doi: 10.1186/s12894-019-0446-8.

[12] Caparelli ML, Shikhman A, Runyan B, Allamaneni S, Hobler S. The Use of Tamsulosin to Prevent Postoperative Urinary Retention in Laparoscopic Inguinal Hernia Repair: A Randomized Double-Blind Placebo-Controlled Study. Surgical Endoscopy. 2021 Oct; 35(10): 5538-5545. doi: 10.1007/s00464-020-08050-0.

[13] Baysden M, Hein D, Castillo S. Tamsulosin for Prevention of Postoperative Urinary Retention: A Systematic Review and Meta-Analysis. American Journal of Health-System Pharmacy. 2023 Mar; 80(6): 373-383. doi: 10.1093/ajhp/zxac349.

[14] Seyedinnavadeh S, Neisanghalb MH, Pazhooha M. Prophylactic Effect of Tamsulosin on Postoperative Urinary Retention in Inguinal Hernia Repair Under Spinal Anesthesia. The American Journal of Surgery. 2025 Jun; 247: 116455. doi: 10.1016/j.amjsurg.2025.116455.

[15] Lai HC, Chang SN, Lin HC, Hsu YL, Wei HM, Kuo CC *et al.* Association Between Urine pH and Common Uropathogens in Children with Urinary Tract Infections. Journal of Microbiology, Immunology and Infection. 2021 Apr; 54(2): 290-298. doi: 10.1016/j.jmii.2019.08.002.

[16] Nadeem S, Badawy M, Oke OK, Filkins LM, Park JY, Hennes HM. Pyuria and Urine Concentration for Identifying Urinary Tract Infection in Young Children. Pediatrics. 2021 Feb; 147(2). doi: 10.1542/peds.2020-014068.

[17] Kumar R, Sahay N, Naaz S. Intra-Operative Pinkish-Red Discoloration of Urine: Rule Out Anesthetic Drug as a Cause. Ain-Shams Journal of Anesthesiology. 2023 Feb; 15(1): 7. doi: 10.1186/s42077-023-00303-z.

DOI: https://doi.org/10.54393/pjhs.v7i5.3704

[18] Li H, Zhang W, Xu G, Wang D, Xu C, Zhang H *et al.* Prophylactic Tamsulosin Can Reduce the Risk of Urinary Retention After Surgery in Male Patients: A Systematic Review and Meta-Analysis. Frontiers in Surgery. 2022 Nov; 9: 930707. doi: 10.3389/fsurg.2022.930707.

[19] Gao B, Zhang D, Wang Y, Wang Z, Wang Z. The Effect of Tamsulosin in Postoperative Urinary Retention: A Meta-Analysis of Randomized Controlled Trials. Naunyn-Schmiedeberg's Archives of Pharmacology. 2023 Mar; 396(3): 441-451. doi: 10.1007/s00210-022-02343-y.

[20] Papageorge CM, Howington B, Leverson G, Kennedy GD, Carchman EH. Preoperative Tamsulosin to Prevent Postoperative Urinary Retention: A Randomized Controlled Trial. Journal of Surgical Research. 2021 Jun; 262: 130-139. doi: 10.1016/j.jss.2020.12.055.