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Pre-operative Prophylactic Tamsulosin for the Prevention of Postoperative Urinary Retention: A Single Centre, Prospective Case Control Study

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Abstract: ***Background: Postoperative urinary retention (POUR) is a common occurrence following surgery. The use of alpha-blockers, such as tamsulosin, has benefited many patients with a history of obstructive uropathy by decreasing lower urinary tract symptoms such as distension, infections, and stricture formation, as well as the incidence of POUR. This study was undertaken to examine the prophylactic effects of tamsulosin in the prevention of POUR following spinal anaesthesia. Methods: A total of 100 patients who underwent elective surgery under spinal anesthesia were included in this study. The patients were randomly allocated into two Groups. The Group I received 0.4mg of tamsulosin orally. Patients in Group II received a placebo. All patients were closely followed for 24 hours postoperatively and their episodes of urinary retentions were recorded. Results: Of the 50 patients given tamsulosin, 4 (8%) developed POUR compared to 17 (34%) from the control group (p = 0.026). In the tamsulosin group, 2 (4%) patients and 7 (14%) patients in the control group required catheterization postoperatively (p= 0.159). Conclusion: The use of prophylactic tamsulosin can possibly reduce the incidence of urinary retention and the need for catheterization after elective surgical procedures under spinal anaesthesia.***

Keywords: Post operative urinary retention, prophylactic tamsulosin, spinal anaesthesia

1. Introduction

Postoperative urinary retention (POUR) is defined as the inability to pass any urine in the presence of a percussible or palpable bladder following surgery.[1] POUR is a common occurrence presenting in an estimated 5% to 70% of all surgeries.[2]

Advances in pharmacology, especially, the institution of alpha-blockers such as tamsulosin, has benefited many patients with a history of obstructive uropathy by decreasing lower urinary tract symptoms such as distension, infections, and stricture formation, as well as the incidence of POUR.[2]

In our clinical setup, patients undergoing spinal anaesthesia, regardless of age have a significant incidence of post operative urinary retention, resulting in longer course in the hospital. The aim of this study was to determine if pharmacological intervention using tamsulosin administered perioperativey would reduce the incidence of POUR in patients undergoing spinal anaesthesia. Increased understanding of this therapy will aid in minimizing the morbidity following surgeries and hence resulting in better treatment outcomes.

2. Material and methods

This is a single centre, prospective case control study that was conducted at a medical college in the city of Bangalore, India. Following an institutional ethics committee clearance and informed consent, patients who were to undergo elective surgeries under spinal anesthesia during the months of August to November 2018 were randomly assigned to one of the two groups. The treatment group received 0.4 mg Tamsulosin orally half an hour prior to surgery while the control group did not receive any medication. The exclusion criteria were utilized during the recruitment process was the presence of previous or current urological or neurological disease, active urinary tract infection, history of urological surgery, medical co-morbidities such as hypertension, cardiac disease, altered renal function tests, those on indwelling urinary catheters and patients with any preoperative medications that could interfere with voiding.

Preoperatively, all patients underwent baseline blood investigations, chest X-ray and urine analysis. The Post Voiding Residual (PVR) volume was assessed as well. All patients were made to completely void just prior to surgery.

Intra-operatively, a standardized protocol of analgesia and intravenous fluid administration was followed in all patients to decrease bias. Post-operatively the patient was followed for 24 hours to identify urinary retention (abdominal discomfort, failure to pass urine for 24 hours, or a palpable suprapubic mass or incomplete emptying of the bladder defined as a PVR > 200 ml as per hospital protocol). If retention was identified, intermittent catheterization was initially tried followed by catheterization.

The primary outcome was urinary retention and the secondary outcome was need for catheterization. Statistical analysis was performed using SPSS 16.0 for Windows and Fisher's exact test was used with a p value of less than 0.05 was considered statistically significant.

3. Results

Fifty patients were recruited to each group. Of the enrolled subjects, 64 were male and 36 female. The demographic data are presented in the table 1. The mean age in both

groups was similar with the sex distribution and was not significantly different. There was no variation in pre-operative high PVR. Herniorraphy was the most common surgery performed and appendectomy the least commonly performed.

In group I, of the 50 patients given tamsulosin, 4/50 (8%) developed POUR in comparison to 17/50 (34%) patients in group II or the control group (p = 0.026). A total of 21 patients developed POUR. In the tamsulosin group, 2/50 (4%) patients and 7/50 (14%) patients in the control group required catheterization postoperatively (P = 0.159)(table 2).There was no significant correlation between age and type of surgery performed.

4. Discussion

Postoperative urinary retention (POUR) is a complication that is many a time under estimated and often missed. POUR refers to patients' inability to void urine despite a full bladder following a surgical intervention in the postoperative period.[3, 4] Apart from causing prolonged hospitalization, POUR is a source of significant discomfort and morbidity to the patient. An over-distended bladder can cause severe suprapubic pain, nausea and vomiting. Bladder distension and the resulting pain can result in sympathetic over- activity leading to haemodynamic disturbances such as hypertension, cardiac dysrhythmias etc.[5, 6]

The etiology of POUR is multifactorial and a number of factors have been identified which can influence the occurrence of urinary retention in the postoperative period.[4, 7] The incidence of POUR increases with age.[8] Petros et al reviewed 295 patients who underwent inguinal herniorrhaphies under of spinal anesthesia and concluded that age less than 53 years reduces the risk of POUR.[7] Lee and colleagues declared that POUR increases with age, with the risk increasing by 2.4 to 2.8 times in patients over 50 years of age.[9] Similarly, our study demonstrated that 16/21(76%) individuals were aged > 50 years. This is possibly related to deterioration of the neurologic pathway responsible for urination with advancing age. Additionally, the increased incidence of prostatomegaly in older males could also be a contributory factor for POUR.[4, 7, 10] Concurrent with a majority of the studies and reviews, our study revealed a higher incidence of POUR in males accounting for 14(66.6%) of the overall 21 patients presenting with POUR.[6, 11, 12, 13]

The anesthetic technique instituted has a bearing on POUR. Baldini et al reviewed 190 studies to evaluate the perioperative factors responsible for POUR and found that the overall incidence was higher with regional anesthesia as compared to general anesthesia.[6] Spinal anesthesia, causes prolonged blockage of transmission of action potentials in the sacral nerves innervating the bladder due to which the sensation of urgency to void on bladder distention disappears. Thus, the normal urination process is not restored, even after emptying the bladder with a Foley catheter. Such patients are said to have developed POUR. With time, the level of analgesia regresses to L5, reaching thereafter to S2–S4 and the strength of the detrusor muscle of the bladder start returning to normal, allowing the patient to void urine.[2, 14]

The stress response to surgery, specifically, postoperative pain increases the sympathetic tone. Durant et al demonstrated that ephinephrine when injected intraperitoneally in unanesthetized rats, increases the intravesical pressure without raising urine output, indicating that ephinephrine increases internal urethral sphincter tone by acting on alpha receptors in the bladder neck.[15] Sympathetic stimulation leads to bladder wall (detrusor) relaxation and internal sphincter contraction via the alpha adrenergic receptors, potentially leading to POUR. The micturition reflex might be inhibited by the high sympathetic activity after surgery.[15, 16]

Alpha-blocker premedication might have inhibitory effect on the elevated sympathetic activity and therefore, prevent acute urinary retention after surgery.[6] The purpose of pharmacologic prevention of POUR is to increase of detrusor con tractility or bladder neck and proximal urethral relaxation. Alpha-adrenergic receptors are found in trigone of bladder, prostatic urethra and ureters. These receptors cause contraction of the smooth muscles in these regions.[17] Alpha-adrenergic blockers decrease bladder outlet resistance and hence facilitate micturation. Although all alpha-blockers show similar efficacy for lower urinary tract symptoms treatment, the third generation blockers like tamsulosin demonstrate a increased selectivity for the prostate and bladder. [18]

Analyzing our study vis- a- vis with previous studies done in this regard we found that Madani et al. in a randomized control study explored the preventive effect o f tamsulosin on POUR following spinal anesthesia, wherein, 118 patients received 0.4mg tamsulosin and 114 patients received placebo.[2] They concluded that the perioperative administration of tamsulosin reduced the risk of POUR from 21.1% to 5.9%. Similarly, Akkoc et al. administered 0.4mg tamsulosin orally, before surgery and observed that 15 /60 (25%) patients in the placebo group had urinary retention in comparison to 3/60(5%) patients in the tamsulosin group.[1] Our findings are similar with 4/50 (8%) patients in the tamsulosin group developing POUR in comparison to 17/50 (34%) patients in the placebo group further emphasizing the importance of tamsulosin in the prevention of POUR (p value - 0.026).

Incomplete emptying due to retention also predisposes to urinary tract infections (UTI) in the postoperative period. Even a single brief catheterization has the propensity to introduce infection into the urinary tract.[6] Catheterization being an invasive procedure, carries additional risks such as urethral trauma and discomfort.[3] In the tamsulosin group, 2 (4%) patients and 7 (14%) patients in the control group required catheterization postoperatively (P = 0.159).

Our study is limited by a small sample size which may lead to underpowered conclusions, as well as it being a single centre study. Further studies with larger cohorts may be required to substantiate these findings.

5. Conclusion

This study suggests that the administration of tamsulosin preoperatively reduces the incidence of postoperative urinary retention and the need for catheterization in patients undergoing elective surgeries under spinal anesthesia. Hence, the use of tamsulosin can be recommended in patients who will be undergoing surgery under spinal anesthesia.

References

[1] Akkoc A, Aydin C, Topaktas R, Kartalmis M, Altin S, Isen K, et al. Prophylactic effects of alpha-blockers, tamsulosin and alfuzosin, on postoperative urinary retention in male patients undergoing urologic surgery under spinal anaesthesia. Int Braz J Urol. 2016;42(3):578–84.

[2] Madani AH, Aval HB, Mokhtari G, Nasseh H, Esmaeili S, Shakiba M, et al. Effectiveness of tamsulosin in prevention of post-operative urinary retention: A randomized double-blind placebocontrolled study. Int Braz J Urol. 2014;40(1):30–6.

[3] Agrawal K, Majhi S, Garg R. Post-operative urinary retention: Review of literature. World Journal of Anesthesiology. 2019 Jan 15;8(1):1-2

[4] Tammela T, Kontturi M, Lukkarinen O. Postoperative urinary retention: I. Incidence and predisposing factors. Scandinavian journal of urology and nephrology. 1986 Jan 1;20(3):197-201.

[5] Brouwer TA, Rosier PF, Moons KG, Zuithoff NP, van Roon EN, Kalkman CJ. Postoperative Bladder Catheterization Based on Individual Bladder CapacityA Randomized Trial. Anesthesiology: The Journal of the American Society of Anesthesiologists. 2015 Jan 1;122(1):46-54.

[6] Baldini G, Bagry H, Aprikian A, Carli F. Postoperative Urinary RetentionAnesthetic and Perioperative Considerations. Anesthesiology: The Journal of the American Society of Anesthesiologists. 2009 May 1;110(5):1139-57.

[7] Petros JG, Rimm EB, Robillard RJ, Argy O. Factors influencing postoperative urinary retention in patients undergoing elective inguinal herniorrhaphy. The American journal of surgery. 1991 Apr 1;161(4):431-3.

[8] Lau H, Lam B, Patil NG. Management of postoperative urinary retention: a randomized trial of in-out versus overnight catheterization. Annals of the College of Surgeons of Hong Kong. 2004 May;8(2):A5.

[9] Lee SJ, Kim YT, Lee TY, Woo YN. Analysis of risk factors for acute urinary retention after non-urogenital surgery. Korean Journal of Urology. 2007 Dec 1;48(12):1277-84.

[10] Keita H, Diouf E, Tubach F, Brouwer T, Dahmani S, Mantz J, Desmonts JM. Predictive factors of early postoperative urinary retention in the postanesthesia care unit. Anesthesia & Analgesia. 2005 Aug 1;101(2):592-6.

[11] Myles PS, Hunt JO, Moloney JT. Postoperative 'minor'complications: comparison between men and women. Anaesthesia. 1997 Apr;52(4):300-6.

[12] Darrah DM, Griebling TL, Silverstein JH. Postoperative urinary retention. Anesthesiology clinics. 2009 Sep 1;27(3):465-84.

[13] Toyonaga T, Matsushima M, Sogawa N, Jiang SF, Matsumura N, Shimojima Y, Tanaka Y, Suzuki K, Masuda J, Tanaka M. Postoperative urinary retention after surgery for benign anorectal disease: potential risk factors and strategy for prevention. International journal of colorectal disease. 2006 Oct 1;21(7):676-82.

[14] Axelsson K, Möllefors K, Olsson JO, Lingårdh G, Widman B. Bladder function in spinal anaesthesia. Acta anaesthesiologica scandinavica. 1985 Apr;29(3):315-21.

[15] Durant PA, Yaksh TL. Drug effects on urinary bladder tone during spinal morphine-induced inhibition of the micturition reflex in unanesthetized rats. Anesthesiology: The Journal of the American Society of Anesthesiologists. 1988 Mar 1;68(3):325-34.

[16] Kamphuis ET, Ionescu TI, Kuipers PW, de Gier J, van Venrooij GE, Boon TA. Recovery of storage and emptying functions of the urinary bladder after spinal anesthesia with lidocaine and with bupivacaine in men. Anesthesiology: The Journal of the American Society of Anesthesiologists. 1998 Feb 1;88(2):310-6.

[17] Janane A, Hamdoun A, Hajji F, Dakkak Y, Ghadouane M, Ameur A, Abbar M. Usefulness of adjunctive alpha1-adrenergic antagonists after single extracorporeal shock wave lithotripsy session in ureteral stone expulsion. Canadian Urological Association Journal. 2014 Jan;8(1-2):E8.

[18] Agrawal MS, Yadav A, Yadav H, Singh AK, Lavania P, Jaiman R. A prospective randomized study comparing alfuzosin and tamsulosin in the management of patients suffering from acute urinary retention caused by benign prostatic hyperplasia. Indian journal of urology: IJU: journal of the Urological Society of India. 2009 Oct;25(4):474.1