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# A COMPARATIVE STUDY OF USE OF TAMSULOSIN IN PREVENTION OF POST-OPERATIVE URINARY RETENTION IN PATIENTS OPERATED UNDER SPINAL ANAESTHESIA

General Surgery

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## ABSTRACT

**INTRODUCTION** -Urinary retention is one of the most common complications of surgical procedures done under spinal anaesthesia. Postoperative urinary retention (POUR) is a common and potentially serious morbidity. Overall incidence of POUR ranges from 5% to 70%.
**AIMS AND OBJECTIVES** - The aim of this prospective study was to investigate the prophylactic effect of Tamsulosin, a super-selective α-1a adrenergic blocking agent, on the development of urinary retention in patients undergoing elective surgeries under spinal anaesthesia
**METHOD-** This is a randomized control trial done in patients undergoing elective surgery under spinal anaesthesia during this study period of one and half years by taking 80 patients each in Tamsulosin group and control group
**RESULTS-** There was significantly lower in POUR in Tamsulosin group compared to placebo, independent of the PVR, Prostate size in USG in cc, Pre op fluid administered in ml and duration of surgery.
**CONCLUSION-** Prophylactic use of alpha-adrenergic blocker is effective in preventing postoperative urinary retention thereby avoiding the morbidity associated with bladder catheterisation.

## KEYWORDS

Tamsulosin , Post operative urinary retention , Alpha blocker

## INTRODUCTION

Urinary retention is the most common complication after surgery and anaesthesia with an incidence of about 5% to 70%. Factors affecting the POUR include age, gender, type of anaesthesia and drugs , type and duration of surgery , comorbidities , impact of analgesia etc . POUR - Post operative urinary retention is defined as the complete and sudden inability to pass urine with control in spite of the presence of urine in the bladder and the desire to pass urine after surgery Ultrasound KUB helps to assess accurate measurement of volume of urinary bladder and provides to help in the POUR management. Inappropriate management of POUR leads to complications like bladder overdistension, UTI, and other complications related to catheter like Injury to Urethra, bladder , stricture urethra etc.

**Causes of POUR include :**

- Post-operative perineal and lower quadrant abdominal pain which inhibits perineal muscle relaxation and voiding .
- Immobilization , Posture of patient at the time of voiding (Supine) contribute to dysfunction during voiding, postoperatively

Many pharmacological techniques have been suggested to prevent/treat persisting POUR . One of such pharmacological agent is the α-adrenergic blockers . They help in voiding by smooth muscle tone relaxation and relieving obstruction.

Tamsulosin is a selective α1A and α1D adrenoceptor antagonist, causing relaxation of the smooth muscles in the prostate, neck of bladder and distal ureter. The drug is well absorbed, and has a t1/2 of 5–10 hours, and is extensively metabolized by CYP-P enzymes .

## METHODS

This is a randomized control trial done in patients undergoing elective surgery under spinal anaesthesia in JSS Hospital , Mysuru during a period of one and half years by taking 80 patients each in tamsulosin group and control group

## INCLUSION CRITERIA

Patients aged 20 to 75 years undergoing elective surgeries under spinal anaesthesia with significant post-voidal residual urine detected on USG KUB /Abdomen and pelvis with no urinary symptoms like

1. Inguinal hernioplasty
2. Trendelenberg procedure
3. Fasciotomy of Lower limbs
4. Perineal surgeries

## EXCLUSION CRITERIA

1. Age less than 20 and more than 75 years
2. Active UTI
3. Patient on medications interfering with voiding functions like alpha agonists and antagonists, cholinergic and anti cholinergics
4. Urinary incontinence
5. H/O of Neurological, urological or systemic disease like multiple sclerosis, Prostate cancer, DM
6. Intravenous fluid administration exceeding 1500cc during surgery
7. Patients with symptomatic BPH
8. Patients who are already catheterised

These patients were separated into two groups by simple randomisation with SNOSE Technique.
1) **Group 1** - With consent , was monitored for urinary retention subjected to Tamsulosin
2) **Group 2** - With consent , was monitored for urinary retention , without Tamsulosin

Tamsulosin with dose of 0.4mg was administered 12 hours and 2 hours before surgery followed by monitoring the patients till they pass urine.

## RESULTS

Out of total of 160 patients ,the below table shows the age wise distribution of the patients in both groups . Mean age after data collection was found to be 48.10 in Group A and 47.59 in Group B.

**Table 1 – Age distribution between Tamsulosin vs Placebo groups**

| | Group | | | |
|---|---|---|---|---|
| | Tamsulosin | | Placebo | |
| | Mean | SD | Mean | SD |
| Age in yrs | 48.10 | 13.36 | 47.59 | 16.39 |

Percentage of Male in Group A was 73.8% and Group B was 70% . Percentage of Female in Group A was 26.3% and Group B was 30% .

**Table 2 – Bar graph depicting Gender prevalence in both groups**

| | | Group | | | |
|---|---|---|---|---|---|
| | | Tamsulosin | | Placebo | |
| | | Count | Column N % | Count | Column N % |
| Sex | Female | 21 | 26.3% | 24 | 30.0% |
| | Male | 59 | 73.8% | 56 | 70.0% |

By Per rectal examination , Group A had 63.9% of Candidates with Grade 2 prostatomegaly and 36.1 % candidates with Grade 3 prostatomegaly. Group B had 53.6% candidates with Grade 2 prostatomegaly and 46.4 % candidates with Grade 3 prostatomegaly .

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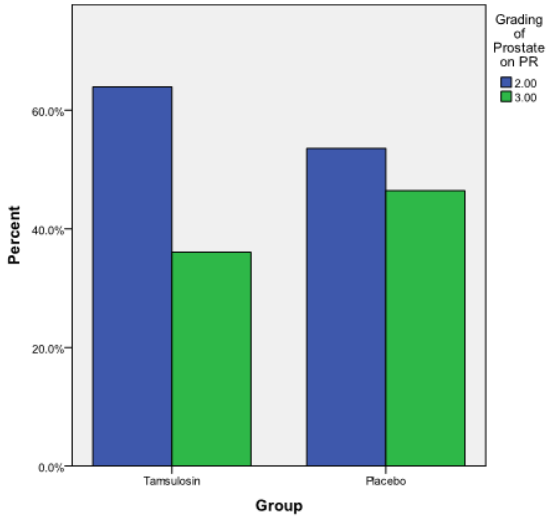


**Table 3 – Bar Graph depicting Prostate Grades in Test and control groups**

The mean Prostate size in each group was found to be 27.05cc in Tamsulosin group and 30.21cc in Placebo group

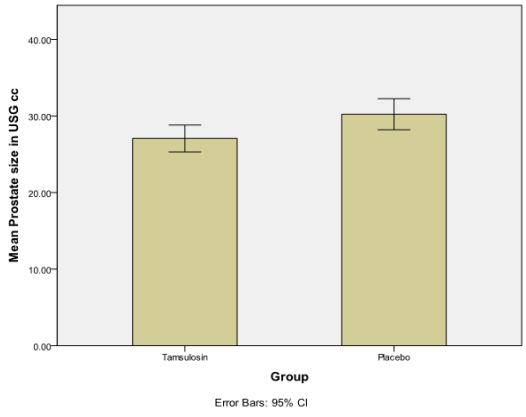


**Table 4 – Ultrasonographic Prostate Size Distribution Among Both Groups**

Group A had mean PVR of 69.10 ml and Group B of 68.50 ml in preoperative USG abdomen pelvis/USG KUB respectively .

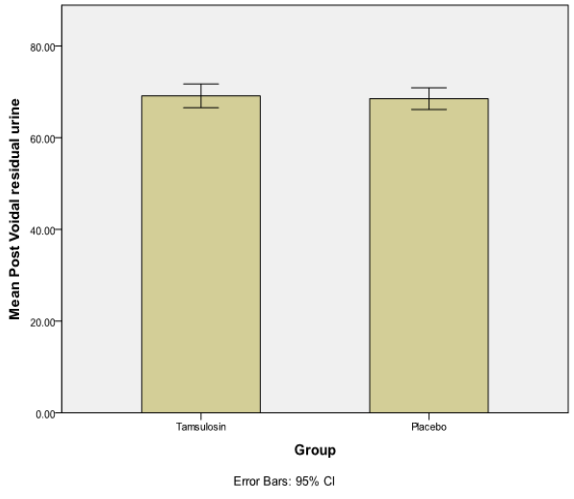


**Table 5 – Preoperative PVR urine among both groups**

From the following table , Group A and B had perioperative period of 86.56 minutes and 83.17 minutes as intraoperative duration respectively . Mean fluid administered was found to be 456.69 ml and 327.69 ml in Group A and B respectively .

**Table 6 – Distribution of duration of surgery and preoperative fluid administered among both groups**

| | Group | | | | |
|---|---|---|---|---|---|
| | Tamsulosin | | Placebo | | |
| | Mean | SD | Mean | SD | p |
| Duration of surgery | 86.56 | 33.27 | 83.17 | 29.42 | 0.5 |
| Preop fluid administered ml | 456.69 | 180.04 | 327.69 | 147.50 | <0.0001 |

95% candidates in Group A under Tamsulosin influence had POUR for less than 12 hours on comparison with 78.8 % candidates in Group B , under Placebo , which shows significant drop in POUR with patients with Tamsulosin

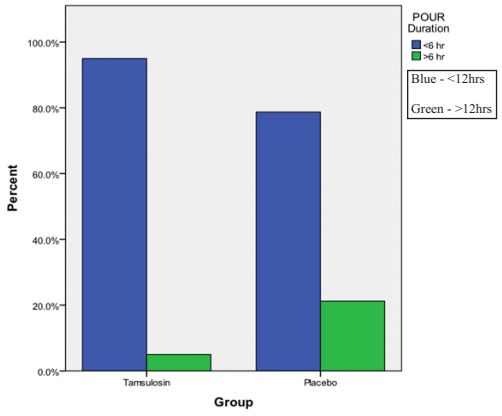


**Table 7-Graph depicting POUR distributed among both groups**

Out of 34 patients who underwent perianal surgeries , 18 patients were in Tamsulosin group and 16 patients were in placebo group . In the Tamsulosin group , POUR <12 hrs was 85% and in Placebo group it was 67.6%

Out of 51 patients who underwent hernioplasty , 33 were in Tamsulosin group and 24 were in Placebo group . In the Tamsulosin group POUR less than 12 hours was 95% whereas in Placebo it was 75% .

**Table 8- Table showing POUR distribution in different surgeries which were significant**

| Surgery | Group | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Tamsulosin | | | | Placebo | | | |
| | POUR Duration | | | | POUR Duration | | | |
| | <12 hr | | >12 hr | | <12 hr | | >12 hr | |
| | Count | Row N % | Count | Row N % | Count | Row N % | Count | Row N % |
| Fissurectomy with LAS | 3 | 75.0% | 1 | 25.0% | 2 | 100.0% | 0 | .0% |
| Fistulectomy | 4 | 80.0% | 1 | 20.0% | 2 | 66.7% | 1 | 33.3% |
| Hemorrhoidectomy | 9 | 100.0 % | 0 | .0% | 4 | 36.4% | 7 | 63.6% |
| Hernioplasty | 32 | 97.0% | 1 | 3.0% | 18 | 75.0% | 6 | 25.0% |
| I & D | 7 | 100.0 % | 0 | .0% | 1 | 100.0% | 0 | .0% |
| Orchidectomy | 2 | 100.0 % | 0 | .0% | 2 | 100.0% | 0 | .0% |
| Sinus Excision | 0 | .0% | 0 | .0% | 7 | 100.0% | 0 | .0% |
| Split Skin Grafting | 2 | 100.0 % | 0 | .0% | 4 | 100.0% | 0 | .0% |
| Trendelenberg's procedure | 1 | 100.0 % | 0 | .0% | 3 | 75.0% | 1 | 25.0% |
| Varicocectomy | 0 | .0% | 0 | .0% | 1 | 33.3% | 2 | 66.7% |
| Wound debridement | 11 | 100.0 % | 0 | .0% | 14 | 100.0% | 0 | .0% |

**BASED ON LOGISTIC REGRESSION :**

| Age Group | Group | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Tamsulosin | | | | Placebo | | | |
| | POUR Duration | | | | POUR Duration | | | |
| | <12 hr | | >12 hr | | <12 hr | | >12 hr | |
| | n | Row N % | n | Row N % | n | Row N % | n | Row N % |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| <30 | 10 | 100.0% | 0 | .0% | 9 | 75.0% | 3 | 25.0% |
| 31-40 | 15 | 93.8% | 1 | 6.3% | 12 | 66.7% | 6 | 33.3% |
| 41-50 | 17 | 94.4% | 1 | 5.6% | 14 | 87.5% | 2 | 12.5% |
| 51-60 | 17 | 100.0% | 0 | .0% | 11 | 84.6% | 2 | 15.4% |
| >61 | 17 | 89.5% | 2 | 10.5% | 17 | 81.0% | 4 | 19.0% |
| Total | 76 | 95.0% | 4 | 5.0% | 63 | 78.8% | 17 | 21.3% |
| p | 0.6 | | | | 0.6 | | | |

| | B | S.E. | Wald | df | p | OR | 95% C.I.for OR | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| Group (Tamsulosin vs Placebo) | -2.592 | .931 | 7.746 | 1 | .005 | .075 | .012 | .465 |
| Prostate size in USG in cc | -.029 | .043 | .442 | 1 | .506 | .972 | .893 | 1.058 |
| PV R | -.021 | .031 | .472 | 1 | .492 | .979 | .922 | 1.040 |
| Pre op fluid administered in ml | .003 | .002 | 2.192 | 1 | .139 | 1.003 | .999 | 1.008 |
| DOS | -.024 | .014 | 2.834 | 1 | .092 | .976 | .949 | 1.004 |
| Constant | 1.584 | 2.424 | .427 | 1 | .513 | 4.874 | | |

a. Variable(s) entered on step 1: Group, Prostate size in USG in cc, PVR, Preop fluid administered in ml, DOS.

## DISCUSSION

Urinary retention is a post-operative complication, commonly encountered ,most frequently post - gynecologic, perineal and urological (lower urinary tract) surgeries[1]. Urinary retention produces abdominal discomfort post procedure. Majority of the patients will need catheterization, which is associated with risk of injury to urethra and catheter-associated urinary Tract Infection.

There are many factors that help influence the development of POUR such as effect of anaesthetic agent on the urinary bladder, trauma during instrumentation, dissection of the pelvis , enthusiastic iv hydration resulting in distension of bladder , diminished awareness of bladder sensation due at anaesthesia , increased resistance of Bladder outlet , postoperative immobilization , post-operative pain (nociceptive inhibitory reflex), use of narcotics analgesics , patient age and sex[2]

Three methods were used in diagnose POUR. These include 1) history of lower quadrant abdominal pain and physical examination by palpation or percussing over suprapubic area to identify palpable bladder; 2) bladder catheterization ; 3) ultrasonographic bladder assessment postoperatively .

In our study , we have used history and physical examination like patients discomfort of lower abdomen or palpable bladder or not able to pass urine for 12 hours and more after spinal anaesthesia as criteria to confirm POUR .

Generally , the incidence of urinary retention after hernia repair has a range from 0.2 to 30% [3] because, the inguinal site pain causes stimulation of the alpha receptors in neck of bladder and proximal part of urethra which results in increased uretheral resistance and bladder tone . In our study, out of 51 patients who underwent hernioplasty , 33 were in Tamsulosin group and 24 were in Placebo group . In the Tamsulosin group , patient passing urine in less than 6 hours was 95% whereas in Placebo it was 75% ,which shows there is significant reduction in POUR with pre operative tamsulosin therapy.

Mohammadi - Fallah et al ,in his study also assessed the effect of using tamsulosin preoperatively to prevent urinary retention post hernia surgery . In the randomized study, 0.4mg tamsulosin was administered to 40 patients 12 hours before the procedure and 6-12 hours after surgery . 40 patients received placebo in the same manner. They proved that administration of tamsulosin before the procedure reduces the risk of POUR significantly to 2.5% from 15%(p = 0.04).

| Study | Number of patients | Incidence of POUR following Herniorraphy |
|---|---|---|
| This study | 33 | 3% |
| Mohammadi Fallah et al | 40 | 2.5% |
| Gonullu et al | 84 | 10.8% |
| Hamidi et al | 14 | 16% |

Another study by Jensen et al , conducted a Medline-based metasearch which intended to determine the POUR incidence following hernial repair with different anaesthesia. Here the incidences of POUR , following surgeries done under local anaesthesia, regional anaesthesia, and general anaesthesia were compared and was found to be 0.37%, 2.4%, and 3.0%, respectively.[4]

Superior pain control with Local anaesthesia for Herniorraphy may provide a explanation for low POUR .[5]

Petros et al. did a retrospective study and reviewed 295 inguinal hernial repairs and found that age 53 years and less and perioperative fluid administration of 1200 ml and less significantly reduced the POUR incidence .Therefore, limitation of perioperative fluid volume and adequate analgesia are other reasonable measures to reduce POUR incidence.[6]

Of the 34 patients who underwent perianal surgeries (Fistulectomy , Fissurectomy and Haemorrhoidectomy) in our study , 18 patients were in tamsulosin group and of them 22.5% of the patients developed retention of urine postoperatively . In the group taking placebo ,out of 16 patients , 33.3% developed urinary retention of urine and they required urinary bladder catheterization.

In the study conducted by Ahmad et al , on patients undergoing benign Anorectal surgeries , Out of 313 in a group ,8 patients who constituted 2.5% of candidates in the Tamsulosin group developed post operative retention of urine. In control group, out of 313 ,56 patients (18% of candidiates) developed retention of urine and required bladder catheterization. Incidence of urinary retention was significantly more in men who perioperatively did not receive α blocker - Tamsulosin .[7]

| Study | Number of patients | Incidence of POUR following anorectal surgeries |
|---|---|---|
| Our study | 18 | 22.5% |
| Ahmed et al | 313 | 2.5% |
| Cataldo et al | 25 | 40% |

In our study , irrespective of the type of surgery , incidence of POUR in tamsulosin group was 5 % and in control group it was 21.3% . and hence it can be said that ,there was significant reduction of POUR in Tamsulosin group compared to placebo, independent of the PVR, Prostate size in USG in cc, Pre op fluid administered in ml and duration of surgery.

As per the logistic regression, risk of POUR is 7.5 times lesser in Tamsulosin group compared to Placebo. Hence , Tamsulosin the superselective long acting alpha-1a blocker can be accepted after weighing its benefits and side effects as a preoperative medication in reducing POUR .

## CONCLUSION

From this study done in a total of 160 patients admitted for elective surgery under spinal anaesthesia, there was reduction in POUR in Tamsulosin group when compared to control group . Tamsulosin given perioperatively in a dose of 0.4mg 12 hours apart is safe without any significant side effects apart from being effective in preventing urinary retention.

Hence we would like to conclude that the prophylactic use of alpha-adrenergic blocker is effective in preventing postoperative urinary retention thereby avoiding the morbidity associated with bladder catheterisation.

## REFERENCES :


1. Stallard, S., & Prescott, S. (1988). Postoperative urinary retention in general surgical patients. *British journal of surgery*, *75*(11), 1141-1143.
2. Petros, J. G., Rimm, E. B., Robillard, R. J., & Argy, O. (1991). Factors influencing postoperative urinary retention in patients undergoing elective inguinal herniorrhaphy. *The American journal of surgery*, *161*(4), 431-433.
3. Goldman, G., Leviav, A., Mazor, A., Kashtan, H., Aladgem, D., Greenstein, A., & Wiznitzer, T. (1988). α-adrenergic blocker for postherniоplasty urinary retention: prevention and treatment. *Archives of Surgery*, *123*(1), 35-36.
4. Jensen, P., Mikkelsen, T., & Kehlet, H. (2002). Postherniorrhaphy urinary retention—effect of local, regional, and general anesthesia: a review. *Regional anesthesia and pain medicine*, *27*(6), 612-617.
5. Mulroy, M. F. (2002). Hernia surgery, anesthetic technique, and urinary retention--apples, oranges, and kumquats?. *Regional Anesthesia and Pain Medicine*, *27*(6), 587.
6. Petros, J. G., Rimm, E. B., Robillard, R. J., & Argy, O. (1991). Factors influencing postoperative urinary retention in patients undergoing elective inguinal herniorrhaphy. *The American journal of surgery*, *161*(4), 431-433.
7. Ahmad, M. M., Wani, H. A., Jeelani, A., Thakur, S., Waseem, M., & Nazir, I. (2014). Preventive effect of tamsulosin on postoperative urinary retention in benign anorectal surgeries. *Saudi Surgical Journal*, *2*(2), 33.