

Original Research Article

Effect of silodosin in post operative retention of urine

Shivkaran Gill*, Rachhpal Singh, Neeti Rajan Singh

Department of Surgery, Shri Guru Ram Das Institute of Medical Sciences and Research, Amritsar, Punjab, India

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***Correspondence:**

Dr. Shivkaran Gill,

E-mail: dr.shivgill296@gmail.com

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ABSTRACT

Background: Post-operative urinary retention (POUR) is a common yet potentially serious morbidity with a reported incidence of 3 to 25%. This study aims to evaluate the effect of Silodosin, a super-selective alpha-1a adrenergic blocking agent, as prophylaxis for post operative urinary retention in patients undergoing various surgical procedures.

Methods: 100 patients were divided into two groups of 50 each. In group 1, patients were given prophylactic silodosin to evaluate its effect in post operative retention of urine and in group 2, patients were not given any medication.

Results: In this study, POUR was diagnosed. POUR was higher in the older age group i.e. more in the age group of 41-60 yrs but in group 1, it was less as compared to group 2. POUR rate in general anaesthesia (GA) patients are less (11.1%) in group 1 as compared to (23.6%) in group 2. POUR rate in spinal anaesthesia (SA) patients are more (21.4%) in group 1 as compared (16.6%) in group 2. The total POUR rate in group 1 was lower (14%) as compared to (22%) in group 2.

Conclusions: In our opinion patients operated under GA, irrespective of gender and type of surgery will benefit from prophylactic silodosin given in pre-operative period for the prevention of POUR and we highly recommend this. Patients who were operated under SA were not benefitted by giving prophylactic silodosin. Probably this is due to use of long acting spinal anesthetic agent in the form of bupivacaine in our patients.

Keywords: POUR, Silodosin, Post-operative, Retention of urine

INTRODUCTION

Urethral catheterization is a common procedure during various surgical procedures that allows monitoring of urine output and guides volume resuscitation and serves as a surrogate marker of haemodynamic stability. With an increase in out patient, day case, ambulatory surgery and other fast track surgical procedures, urethral catheterization is restricted to fewer procedures and for limited time. Awareness and identification of the patients at risk of developing post-operative urinary retention (POUR), assumes greater significance in surgical field.

Post-operative urinary retention (POUR) is a common and potentially serious morbidity with a reported

incidence of 3 to 25%.¹ POUR has been defined as inability to pass the urine in the presence of palpable bladder after surgery.

POUR occurs in patients of both sexes and all age groups and after all types of surgical procedures. Although the incidence of POUR in general surgical population is around 3.8%.² The incidence in joint arthroplasty varies widely 10.7-84%.³ The incidence of POUR after anorectal surgery ranges between 1-52%.⁴ After hernia repair the incidence of POUR ranges between 5.9-38%.⁵

Knowledge of physiology of micturition is a must to have a better perspective of POUR. Many factors contribute to the development of POUR. These include the direct

effects of anaesthetic agents on the bladder, traumatic instrumentation, pelvic dissection, excessive intravenous hydration resulting in bladder distension, immobilisation, use of narcotics for post-operative pain.

Both the health and financial costs of retention are considerable, because it can cause urinary tract infections and necessitate catheterization, which in turn can result in urethral strictures, prolonged hospital stays and additional operations.

Efforts towards the pharmacological prevention and treatment of POUR have focused on increasing detrusor muscle activity or decreasing the opening pressure of the internal sphincter at the bladder neck. It is well stated that adrenergic receptors are present throughout the bladder. Beta adrenergic receptors are present in the base and neck of the bladder. In the acute post-operative setting, sympathetic nerve discharge causes catecholamines release and alpha adrenergic mediated contraction of the bladder neck, resulting obstruction of the bladder outlet.

Administration of sympathomimetic and anticholinergic agents (for example, phenylephrine and atropine) during anesthesia can inhibit contraction of the detrusor muscle in the bladder. This relaxes the bladder and decreases the urge to void and recognition of the bladder is full. The pain in the inguinal region can stimulate the alpha receptors in the bladder neck and proximal urethra, by increasing the urethral resistance and bladder outlet tone. The end result is that the patient attempts to void.

In several clinical studies, alpha-adrenergic blocking agents have been shown to have prophylactic and therapeutic potential on POUR.⁶ The alpha 1 receptor antagonist acts by reducing tone in the bladder outlet, thereby decreasing outflow resistance and facilitating micturition.

Objectives

The main objective of this study was to evaluate the effect of prophylactic silodosin in post-operative retention of urine.

METHODS

The present study was prospective, randomized control trial conducted in the department Of General Surgery, Sri Guru Ram Das Institute of Medical Sciences and Research, Vallah, Sri Amritsar on 100 patients during the period from August 2018 to January 2019. They were randomly divided into two groups of 50 each.

Group 1 (50 patients) were the patients in which prophylactic silodosin was given to evaluate its effect in post operative retention of urine and group 2 (50 patients) were the patients where no medication was given.

Drug prophylaxis (silodosin) in the form 8 mg tablet was given 24 hours before the procedure and on the morning of day of surgery at 5 am with a sip of water to all the study subjects. All patients were closely followed for 24 hours post operatively and any voiding difficulties or urinary retention were recorded. Acute urinary retention was diagnosed when a patient was unable to pass urine, feels pain, has a palpable mass in suprapubic region and encouraging the patient to stand up and walk were unsuccessful and urethral catheterization seemed inevitable.

The following pertinent investigations were carried out in all patients participating in this study i.e. complete blood count, PTI, blood urea and serum creatinine, total serum bilirubin, ALP, SGOT, SGPT, ECG, CXR-PA view, urine complete examination, ultrasound abdomen

Inclusion criteria

Patients of age 18 years and above (both sexes) were included.

Exclusion criteria

Patients with symptomatic benign prostate hypertrophy, severe renal impairment, severe hepatic impairment, concomitant administration with cytochrome P450 3A4 inhibitors (ketoconazole, clarithromycin, itraconazole, ritonavir), pregnant and lactating mother, pediatric patients, active urinary tract infection, previous urological surgery, previous neurological disease, previous urological disease such as urethral stricture, prostatic cancer or bladder cancer, serum creatinine greater than 1.6 mg/dl, urinary incontinency, patients with indwelling Foley catheter were excluded.

The data collected was statistically analyzed using SPSS version 17 and CHI square test was used to find the p values.

The study was approved by the Institutional Ethics Committee.

RESULTS

The present study proposed silodosin as a prophylactic drug for the prevention of POUR. 100 patients of age group 18 to 60 years and of both genders were included in this study after taking informed consent from them. These patients were admitted in the Department of Surgery at Sri Guru Ram Das Institute of Medical Sciences and Research, Vallah, Amritsar for various surgical procedures. 50 patients were given silodosin 8 mg (2 doses in pre to operative period i.e. 24 hours before the procedure and at 5 am on the day of surgery) and 50 patients were in the control group. The following observations were made in this study.

Table 1: Age distribution in groups 1 and 2.

Age (years)	Group		Total
	1	2	
Count (18-30)	11	13	24
(% within group)	(22.0)	(26.0)	(24.0)
Count (31-40)	16	15	31
(% within group)	(32.0)	(30.0)	(31.0)
Count (41-50)	17	13	30
(% within group)	(34.0)	(26.0)	(30.0)
Count (51-60)	6	9	15
(% within group)	(12.0)	(18.0)	(15.0)
Total count	50	50	100
(% within group)	(100.0)	(100.0)	(100.0)

Pearson chi square= 1.332, p value=0.721 (>0.05).

Table 1 shows the age distribution in this study. Patients were divided in 4 age groups, 18 to 30 years, 31 to 40 years, 41 to 50 years and 51 to 60 years. Out of 50 patients in group 1, 11 (22%) were in between 18 to 30 years, 16 (32%) were in between 31 to 40 years, 17 (34%) were in between 41 to 50 years, and 6 (12%) were in between 51 to 60 years. Out of 50 patients in group 2, 13 (26%) were in between 18 to 30 years, 15 (30%) were in between 31 to 40 years, 13 (26%) were in between 41 to 50 years and 9 (18%) were in between 51 to 60 years.

Table 2 shows the sex distribution in this study. Group 1 has 32 (64%) females and 18 (36%) males whereas group 2 has 35 (70%) females and 15 (30%) males.

Table 2: Sex distribution in groups 1 and 2.

Sex	Group		Total
	1	2	
Female count	32	35	67
(% within group)	(64.0)	(70.0)	(67.0)
Male count	18	15	33
(% within group)	(36.0)	(30.0)	(33.0)
Total count	50	50	100
(% within group)	(100.0)	(100.0)	(100.0)

Pearson chi square= 0.407, p value=0.523 (>0.05).

Table 3 shows the number and percentage of patients with various diagnosis in group 1 and group 2.

Table 4 shows the number and percentage of patients with various surgical procedures performed on these patients in group 1 and group 2.

Table 5 shows the type of anesthesia used in this study. In group 1, general anaesthesia (GA) was used in 36 (72%) patients whereas spinal anaesthesia (SA) was used in 14 (28%) patients. In group 2, GA was used in 38 (76%) patients and SA was used in 12 (24%) patients.

Table 6 shows the need for catheterization following POUR in both the groups. In group 1, 7 (14%) patients needed catheterization as compared to group 2 where 11 (22%) patients needed catheterization.

Table 3: Diagnosis distribution in groups 1 and 2.

Diagnosis	Group		Total
	1	2	
Intestinal count perforation	1	0	1
(% within group)	(2.0)	(0)	(1.0)
Appendicitis count	0	1	1
(% within group)	(0)	(2.0)	(1.0)
Breast lump count	0	2	2
(% within group)	(0)	(4.0)	(2.0)
Carcinoma count breast	7	8	15
(% within group)	(14.0)	(16.0)	(15.0)
Cholelithiasis count	25	24	49
(% within group)	(50.0)	(48.0)	(49.0)
Epigastric count hernia	1	0	1
(% within group)	(2.0)	(0)	(1.0)
Fibroadenoma count	1	1	2
(% within group)	(2.0)	(2.0)	(2.0)
Fissure in ano count	1	1	2
(% within group)	(2.0)	(2.0)	(2.0)
Fistula in ano count	2	1	3
(% within group)	(4.0)	(2.0)	(3.0)
Gynecomastia count	1	0	1
(% within group)	(2.0)	(0)	(1.0)
Hemorrhoids count	1	3	4
(% within group)	(2.0)	(6.0)	(4.0)
Hydatid cyst count	0	1	1
(% within group)	(0)	(2.0)	(1.0)

Continued.

Diagnosis	Group		Total
	1	2	
Inguinal hernia count (% within group)	3 (6.0)	2 (4.0)	5 (5.0)
Mammary fistula count (% within group)	0 (0)	1 (2.0)	1 (1.0)
Pilonidal sinus count (% within group)	1 (2.0)	2 (4.0)	3 (3.0)
Pyloric obstruction count (% within group)	1 (2.0)	0 (0)	1 (1.0)
Umbilical hernia count (% within group)	4 (8.0)	3 (6.0)	7 (7.0)
Varicocele count (% within group)	1 (2.0)	0 (0)	1 (1.0)
Total count (% within group)	50 (100.0)	50 (100.0)	50 (100.0)

Pearson chi square- 12.097, p value=0.794 (>0.05).

Table 4: Surgical procedures distribution in groups 1 and 2.

Surgical procedure	Group		Total
	1	2	
Procedures anatomical repair count (surgery) (epigastric hernia) (% within group)	1 (2.0)	0 (0)	1 (1.0)
Anatomical repair count (umbilical hernia) (% within group)	2 (4.0)	3 (6.0)	5 (5.0)
Appendectomy count (% within group)	0 (0)	1 (2.0)	1 (1.0)
Cyst deroofing & count evacuation (% within group)	0 (0)	1 (2.0)	1 (1.0)
Fibroadenoma count excision (% within group)	1 (2.0)	1 (2.0)	2 (2.0)
Fistulectomy count (% within group)	1 (2.0)	1 (2.0)	2 (2.0)
Fistulotomy count (% within group)	1 (2.0)	0 (0)	1 (1.0)
Gastrojejunostomy count (% within group)	1 (2.0)	0 (0)	1 (1.0)
Hemorrhoidectomy count (% within group)	1 (2.0)	3 (6.0)	4 (4.0)
Ileostomy closure count (% within group)	1 (2.0)	0 (0)	1 (1.0)
Laparoscopic count cholecystectomy (% within group)	11 (22.0)	17 (34.0)	28 (28.0)
Lateral internal count sphincterotomy (% within group)	1 (2.0)	1 (2.0)	2 (2.0)
Lumpectomy count (breast lump) (% within group)	0 (0)	2 (4.0)	2 (2.0)
Mammary fistula count excision (% within group)	0 (0)	1 (2.0)	1 (1.0)
Mastectomy count (% within group)	1 (2.0)	0 (0)	1 (1.0)
Mayo's repair count (% within group)	1 (2.0)	0 (0)	1 (1.0)
Mesh repair count (inguinal hernia) (% within group)	3 (6.0)	2 (4.0)	5 (5.0)
Mesh repair count (umbilical hernia) (% within group)	1 (2.0)	0 (0)	1 (1.0)

Continued.

Surgical procedure	Group		Total
	1	2	
MRM count (% within group)	7 (14.0)	8 (16.0)	15 (15.0)
Open count cholecystectomy %within group	14 (28.0)	7 (14.0)	21 (21.0)
Pilonidal sinus count excision (% within group)	1 (2.0)	2 (4.0)	3 (3.0)
Varicocele excision count (% within group)	1 (2.0)	0 (0)	1 (1.0)
Total count (% within group)	50 (100.0)	50 (100.0)	50 (100.0)

Pearson chi square- 18.419, p=0.622 (>0.05).

Table 5: Anaesthesia distribution in groups 1 and 2.

Anaesthesia	Group		Total
	1	2	
GA count (% within group)	36 (72.0)	38 (76.0)	74 (74.0)
SA count (% within group)	14 (28.0)	12 (24.0)	26 (26.0)
Total count (% within group)	50 (100.0)	50 (100.0)	50 (100.0)

Pearson chi square- 0.208, p value=0.648 (>0.05).

Table 6: Need for catheterization in groups 1 and 2.

	Group		Total
	1	2	
Need for no count catheterization following POUR (% within group)	43 (86.0)	39 (78.0)	82 (82.0)
Yes count (% within group)	7 (14.0)	11 (22.0)	18 (18.0)
Total count (% within group)	50 (100.0)	50 (100.0)	100 (100.0)

Pearson chi square- 1.084, p value=0.298 (>0.05).

DISCUSSION

POUR is one of the most common complications of anaesthesia and surgery. It occurs more frequently after lower abdominal, pelvic, gynecologic and anorectal surgeries. POUR causes major discomfort and pain after surgery. Catheterization for resolving it may lead to urethral injury, stricture and urinary tract infection that increases cost of hospitalization period and post-operative morbidity.

POUR was diagnosed when a patient is unable to pass urine himself or herself, feels pain, has a palpable mass in suprapubic region and encouraging the patient to stand up or walk were unsuccessful and urethral catheterization seemed inevitable.

The analysis of data consisting of 100 surgical indoor patients who were included in this study after taking

informed consent from August 2018 to January 2019 at Sri Guru Ram Das Institute of medical sciences and research, Amritsar is presented here. The correlation between different variables and POUR is discussed.

Age and POUR

In our study development of POUR was higher in the older age group i.e. more in the age group of 41 to 60 years but in group 1 (silodosin group) it was less as compared to group 2 (control group). Many studies in the past have shown positive correlation between the increasing age and POUR. Kieta et al have done their study on 313 adults patients undergoing various surgical procedures to determine the predictive factors of early POUR in the post anaesthesia care unit.⁷ In this observational study they found positive correlation of increasing age with POUR.

Sex and POUR

In our study, POUR rate in males were less 22.2% in group 1 (silodosin group) as compared to the 40% in group 2 (control group). Studies done in the past have shown a positive correlation between perioperative use of alpha 1 blockers and decreased rate of POUR in men. Peterson et al have done a study on 60 males to evaluate urinary retention following total hip and knee arthroplasty.⁸ This study showed a statistically decrease in post operative urinary retention with the post operative administration of prazosin ($p < 0.01$).

POUR rate in female patients of both the groups were compared. In group 1 (silodosin group) it was less 9.3% as compared to 14.2% in group 2 (control group). More percentage of male patients developed POUR in our study group as compared to females. As per literature also higher incidence of POUR has been reported in men i.e. 4.7% as compared to women where it is 2.9%.²

GA and POUR

In our study, POUR rate in GA patients was less 11.1% in group 1 (silodosin group) as compared to 23.6% in group 2 (control group). General anaesthetic agents cause bladder atony by interfering with the autonomic nervous system. Diazepam, pentobarbital and propofol all decrease detrusor contractions and isoflurane, methoxyflurane and halothane suppress detrusor contractions. The urodynamic effects caused by volatile anaesthetics and sedative-hypnotic agents appear to be caused by inhibition of pontine micturition centre and the voluntary control of the cortex on the bladder. Petros et al in his study on factors influencing urinary tract retention after elective open cholecystectomy has found that POUR after GA agents depend upon the high cumulative dosage of the anaesthetic agent than upon length of exposure.⁹

SA and POUR

In our study, the POUR rate in SA patients was more 21.4% in group 1 (silodosin group) as compared 16.6% in group 2 (control group). Intrathecal local anaesthetics act on the neurons of the sacral spinal cord segments (S2-S4) by blocking the transmission of the afferent and efferent action potentials on the nervous fibres from and to the bladder. The detrusor contraction (detrusor block) is completely abolished 2-5 min after the injection of spinal anaesthesia, and its recovery depends on the duration of sensory block above the S2 and S3 sacral segments. The use of long acting local anaesthetics is related to a higher incidence of POUR. Lamonerie et al have done a study on prevalence of post operative bladder distension and urinary retention detected by ultrasound measurement on 177 adult patients who had undergone thoracic, vascular, abdominal, orthopedic or ENT surgery.¹⁰ They have concluded in their study that spinal anaesthesia is a risk factor for POUR.

Total POUR rate

The total POUR rate in group 1 (silodosin group) was lower 14% as compared to 22% in group 2 (control group). Many studies done in the past have shown the beneficial effect of alpha blockers in the prophylaxis for post-operative urinary retention. Aliaeviu et al have done a study on administration of alpha blockers to prevent post-operative acute urinary retention after urological operations. Incidence of acute urinary retention following operations on the urinary tract was analysed for 151 patients.¹¹ It is shown that patients given alpha 1 adrenergic blocker sonizin for 5 days before and 3 days after surgery reduced the risk of post operative acute urinary retention by 14%.

CONCLUSION

Many authors in the past have evaluated the prophylactic role of alpha-1 blockers in the prevention of post-operative urinary retention. Tamsulosin, prazosin, Alfuzosin are the drugs of this group that have been studied. To conclude, in our opinion patients operated under GA, irrespective of gender and type of surgery will benefit from prophylactic silodosin given in pre-operative period for the prevention of POUR and we highly recommend this. Patients who were operated under SA were not benefitted by giving prophylactic silodosin. Probably this is due to use of long acting spinal anaesthetic agent in the form of bupivacaine in our patients.

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