Original Research Article

Effects of Tamsulosin in decreasing post operative urinary retention following spinal anaesthesia

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Abstract

Background: Post operative voiding difficulties or post operative urinary retention (POUR) is a significant morbidity inducing condition in the post operative period with varied consequences. While postoperative urinary retention may not usually be a life-threatening issue, it is something to be concerned about and it does require prompt assessment and treatment**. Aim and objective:** To study the Effects of Tamsulosin in decreasing post operative urinary retention following spinal anaesthesia **Methodology:** The present study was an observational, prospective, randomized double–blind placebo controlled trial in which we evaluated the effectiveness of three doses of Tamsulosin 0.4mg (12 hrs before, 1 hr before and 12 hrs after second dose) perioperatively, in prevention of post operative urinary retention in adults patients undergoing lower limb and lower abdominal surgeries under spinal anaesthesia. **Results and discussion:** In tamsulosin group incidence of urinary retention leading to catheterization was 4% as compared to 28% in control group. Voiding difficulty grade 3 and 4 was also more in patients not receiving tamsulosin.

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INTRODUCTION

Post-operative urinary retention is a well-established and commonly encountered problem across all surgical specialties with an incidence ranging from 5% to 75%, in patients undergoing spinal anaesthesia. [1-3] Many factors may contribute to the development of post-operative urinary retention. These include natural history of underlying disease, the direct effects of anaesthetic agents on the urinary bladder, excessive peri-operative fluid administration, traumatic instrumentation, pelvic dissection, diminished awareness of bladder sensation after surgery, increased bladder outlet resistance, immobilization after the surgery, postoperative pain and use of narcotics for the same, type of anaesthesia, duration of surgery, gender and age.[1,3] Certain medications, such as beta blockers and anticholinergic agents, also contribute to post operative urinary retention.[1,4] Post-operative urinary retention causes pain and discomfort after surgery and leads to urinary catheterization for resolving it, thereby leading to increased incidence of urethral stricture, urinary tract infection, increased cost of treatment, work load and hospital stay. [2] It seems that high sympathetic activity increases the risk of urinary retention1. Therefore, inhibition of α-adrenergic receptors located on the bladder neck and proximal urethra may prevent POUR and improve voiding. [5,6] Several drugs including α-blockers

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and parasympaticomimetics had been under investigation for their effectiveness in preventing POUR. [7] Recent evidence has shown that the use of α-blockers facilitate voiding by decreasing the resistance of the proximal urethra and bladder neck and improving the urine flow. [6,8] Tamsulosin is a safe selective α1-adrenergic receptor blocker characterized by its favourable side effect profile. [9]

The prophylactic effect of tamsulosin in reducing POUR has not been investigated in a large randomized double-blind study; therefore the present study was conducted to investigate the efficacy of tamsulosin compared with placebo in preventing POUR. Tamsulosin, being a α-1a receptor blocker acts by reducing tone in bladder outlet, thereby decreasing outflow resistance and decreasing POUR. Use of α1- blockers in female functional bladder neck obstruction showed significant improved in symptoms, maximum flow and post void residual urine volume. Tamsulosin is a safe selective α 1-adrenergic receptor blocker characterized by its favourable side effect profile.[9] Very few studies could be found in literature, which researched efficacy of tamsulosin in reducing voiding difficulties in postoperative patients, receiving spinal anaesthesia.

Aim and objective: To study the Effects of Tamsulosin in decreasing post operative urinary retention following spinal anaesthesia

MATERIAL AND METHODS

This was an observational prospective randomized double-blind placebo controlled study was taken in this department from July 2016 to July 2017.

Inclusion Criteria: 1. Patients posted for lower limb / lower abdominal surgery under spinal anaesthesia 2. Patients of ASA 1 and ASA 2 3. Patients in age group of 20-60 years 4.Patients willing to participate in the study.

Exclusion criteria: 1. Patients with urinary tract disease 2. Catherized patients. 3. Patients with warfarin 4. Patients with sitting systolic blood pressure in the upper extremity of less than 100 mmHg at the time of eligibility screening 5. Patients with Intra operative IV fluid more than 1500 ml 6. Patients with intraoperative blood loss more than 750 ml.

After obtaining the approval from ethical justification committee of Indira Gandhi Medical College and associated hospitals Shimla 100 patients of ASA1 and ASA2 aged 20-60 years of either sex posted for lower limb /lower abdominal surgery under spinal anaesthesia were included in the study. Patients were randomized into two groups using random allocation software and blind randomized study was in which co-guide prepared and delivered the drugs to the patient and maintained the record in the computer. The student in the presence of consultant anaesthesiology performed the subarachnoid block. The drugs given to the patient were disclosed at the end of the study.

Group T (Tamsulosin) patients were given orally 3 doses of Tamsulosin tablet 0.4 mg at 12 hours interval starting a night before surgery.

Group C (Control) patients were also given similar shaped and coloured placebo tablet in the same schedule.

These drugs were coded and given by the investigator who was not involved in further study ensuring double blinding. After data assimilation the codes were broken and statistical analysis was done using appropriate statistical test.

Any patient received spinal anaesthesia with Bupivacaine heavy was enrolled. Type of surgery like Abdominal or lower limb surgery were noted.Dose of Bupivacaine was as a) < 2.5ml b) 2.5—3.0ml c) > 3.0 ml according to requirement of level of blockade. If any adjuvant was added it was noted. After 10 minutes of intrathecal injection level of sensory block was noted with blunt sterile 25 G hypodermic needle by pin prick method.

All patients were closely followed for 24 hours post operatively for voiding and were graded into various voiding difficulty grades as given:

Grade 0: Spontaneous voiding without difficulty.
Grade 1: Voiding with difficulty.
Grade 2: Intermittent single evacuation of bladder.
Grade 3: Intermittent repeated evacuation of bladder
Grade 4: Continuous catheterization.

Data was entered in excel sheet. Data was analysed with appropriate statistical tests.

RESULTS

In tamsulosin group (group T) 15 patients were of the age group 20-29, 14 patients were of 30-39yrs, 9 patients of 40-49 yrs and 12 patients were of the age group 50-60 years. While in control group (group C) there was 6 patients in 20-29 years age group, 16 patients in 30-39 yrs, 8 patients in 40-49 years and 20 patients were of the age group 50-60 years. The two groups were comparable to each other statistically (p >005).In tamsulosin group 39 patients (78%) were male and 11 patients (22%) were female. While in control group 41 patients (82%) were male and 9 patients (18%) were female. Both the groups were statistically comparable to each other in terms of sex wise distribution (p value >005). In our study 75 patients had no comorbidity while 25 patients had some comorbidity. Out of these 25 patients with comorbidity, 10 patients were in group T while group C had 15 patients. When we compared the two groups for incidence of co-morbidity there was statistically no difference (p value >005). In group T there were 17 patients of lower abdominal surgeries and 33 Patients of lower limb

surgeries. In group C 24 patients of lower abdominal surgeries and 26 patients of lower limb surgeries were included. Both groups were comparable to each other and the difference was statistically not significant (p value >0.05). Different volume of hyperbaric bupivacaine was received by some patients in our study. 2.0 ml, 2.5-3.0 ml and > 3ml of drug were given in 2, 6 and 42 patients in group T respectively while 2.0 ml, 2.5-3.0 ml and > 3ml of drug were given in 2, 6 and 42 patients in group C respectively. The two groups were comparable to each other and the difference was statistically non significant (p value > 0.05). Some of our patients received either midazolam or fentanyl as adjuvants in subarchnoid block. Thirty nine patients in group T and 37 patients in group C received subarchnoid block without any adjuvant. 2 patients in each group received midazolam while 9 patients in group T and 11 patients in group C received fentanyl as an adjuvant in subarchnoid block. Two groups were statistically comparable to each other in terms of adjuvants received. Sensory block level achieved at the end of 10 minutes after subarchnoid block, was taken as level of sensory block. 1 patient had T4 sensory block in both group (TandC).T5 sensory block was achieved in 16 patients and 15 patients in TandC group respectively. T6 sensory block level was noted in 22 and 31 patients respectively in T and C group. 9 and 3 patients respectively in T and C group achieved T7 sensory block level. SimilarlyT8 sensory block level was noted in 2 and none patients respectively in T and C group. The groups were comparable to each other and the difference was statistically not significant (p value was > 0.05). Table 1 shows voiding difficulty according to age group. When we compared the groups, i.e. T and C in age group of 50-60 yrs, we found that the difference was statistically highly significant in favour of tamsulosin group (p value<0.000). When compared statistically male sex had significant difference in terms of voiding difficulty (p value was 0.028). While there was no statistically difference in female patients in terms of voiding difficulty grading (p value was 0.669). (table 2) We found that the incidence of urinary retention in terms of voiding difficulty grade was more in lower abdominal surgery as compare to lower limb surgery. In group T there was no statistically difference in terms of voiding difficulty between lower abdominal and lower limb surgery groups (p value was> 0.05). In control group in terms of voiding difficulty there was statistically significant difference between lower limb and lower abdominal surgery (p value was 0.023).(table 3) In group T out of 40 patients without any co-morbidity, 35 patients had no voiding difficulty (G0), while 5 patients had VD of G1. In control group out of 35 patients without comorbidity, 20 patients had no urinary retention in post operative period (VD G0), 7 patients had VD of G1, 2 patients had VD of G2, 2 patients each in VD of G3 and G4. We could not find any co-relation between co-morbidity and urinary retention in terms of voiding difficulty (p value was> 0.05). (table 4) When voiding difficulty was compared between group T and group C in relation to height of sensory block. We could not see any statistically significance between two groups (p value was > 0.05). (table 5) In fentanyl group 3 patients had VD of G1, 2 patients had G2 and 1 patient each had VD of G3 and G4. Patients who received midazolam as adjuvant had no urinary symptoms. In control group 11 patients received fentanyl as adjuvant. When compared statistically we could not find significant difference between non adjuvant andadjuvant receiving patients of both T and C group (p value was > 0.05).

Table 1: voiding difficulty in relation to age group

Age	Group	G0	G1	G2	G3	G4	p-value
20-29	**T**	15	0	0	0	0	0.529
	C	6	0	0	0	0	
30-39	**T**	13	1	0	0	0	0.190
	C	12	4	0	0	0	
40-49	**T**	7	2	0	0	0	0.528
	C	5	2	1	0	0	
50-60	**T**	1	5	4	1	1	0.000**
	C	1	3	2	7	7	

Table 2: voiding difficulty in relation to sex

Sex	Groups	VD score					p- value
		G0	G1	G2	G3	G4	
Male	T	29	6	2	1	1	0.028*
	C	18	8	2	7	6	
Female	T	7	2	2	0	0	0.669
	C	6	1	1	0	1	

Table 3: Voiding difficulty in relation to type of surgery

Groups	Type of surgery	VD score					p value
		G0	G1	G2	G3	G4	
T	LA	9	4	3	0	1	0.165
	LL	27	4	1	1	0	
C	LA	6	5	2	6	5	0.023*
	LL	18	4	1	1	2	

Table 4: voiding difficulty in relation to co morbidity

Co-Morbidity	Groups	VD score					p- value
		G0	G1	G2	G3	G4	
NONE	T	35	5	0	0	0	0.061
	C	22	7	2	2	2	
DM	T	0	1	3	0	1	0.198
	C	0	2	0	1	2	
RD	T	1	1	0	0	0	0.443
	C	2	0	1	1	0	
HTN	T	0	1	1	1	0	0.233
	C	0	0	0	2	2	
	T	0	0	0	0	0	0
DM + HTN	C	0	0	0	1	0	

Table 5: voiding difficulty in relation to Level of sensory block

Level of Sensory Block	Groups	VD SCORE					p-value
		G0	G1	G2	G3	G4	
T4	T	0	1	0	0	0	0.157
	C	0	0	0	1	0	
T5	T	8	4	2	1	1	0.173
	C	2	4	2	3	4	
T6	T	18	2	2	0	0	0.304
	C	21	4	1	2	3	
T7	T	8	1	0	0	0	0.101
	C	1	1	0	1	0	
T8	T	2	0	0	0	0	0
	C	0	0	0	0	0	

Table 6: voiding difficulty in relation to Adjuvants used

Groups	Adjuvants	VD score					p-value
		G0	G1	G2	G3	G4	
T	None	32	5	2	0	0	0.061
	Midazolam	2	0	0	0	0	
	Fentanyl	2	3	2	1	1	
C	None	22	7	2	3	3	0.111
	Midazolam	0	0	0	1	1	
	Fentanyl	2	2	1	3	3	

DISCUSSION

There are different ways to define POUR in literature, from clinical to USG to catheterization methods. Some studies used the amount of urine in the bladder and attached a time frame to their definition, used the amount of 500 ml and attached a 30 minute time frame to their definition.[10,11] Several studies used patient assessment in their definition. Three studies defined post operative urinary retention as the patient wanting to void, but being unable to void.[11,12] Some studies defined post operative urinary retention as an inability to void and the patient being catheterized. [7] We chose clinical voiding difficulty grading for our study. Gonor like many others thus recommends clinical definition of post operative urinary retention to be used for research projects; hence we selected the grading used in this thesis.[7] When we evaluated overall data between both the groups we found that there was significant difference in incidence and severity of voiding difficulties. As many as 7 patients in the non tamsulosin, i.e., control group had to be catheterised for prolonged period compared from only one in tamsulosin group. 14 patients were in grade

3and 4 in control group c.f. only 2 patients in Tamsulosin group.

Thus we found that tamsulosin was protective in incidence of Post operative urinary retention, when we consider overall data, which was in patients undergoing surgery under spinal anaesthesia. Similar findings were obtained in a study by Madani *et al.*. [13] They found that POUR in patients who received tamsulosin was significantly lower than placebo, as 5.9% of the patients treated with tamsulosin and 21.1% placebo group, reported urinary retention following surgery (P = 0.001). This study thus corroborates to our study that short perioperative treatment with tamsulosin can reduce the incidence of urinary retention and the need for catheterization. In a study among 626 patients, undertaken by Ahmad *et al.*. [14] to assess preventive effects of tamsulosin on POUR post anorectal surgeries under spinal anaesthesia, they found that use of tamsulosin led to reduction in incidence of post operative urinary retention. Similar to findings of our study, Mohammad-fallah *et al.*.[13] also found that perioperative Tamsulosin represents effective strategy to reduce the risk of POUR in patients undergoing inguinal herniorrhaphy. Another study was undertaken by Akkoc *et al.*. [15] They also found that incidence of urinary retention (defined in their study as painful suprapubic bulge, confirmed by 500ml of urinary evacuation post catheterization) was significantly lower in tamsulosin group, being 5%, compared from 25% in control group. They also thus suggested as in our own study that pre operative tasmsulosin reduces incidence of POUR and also need for urinary catheterization after surgeries under spinal anaesthesia.

CONCLUSION

Short tamsulosin therapy during peri-operative 0. 4 mg oral tab 10-12 hours preoperatively and 10-12 hours post operatively for short period led to reduction in incidence of post-operative urinary retention.

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