ORIGINAL RESEARCH PAPER

Volume-8 | Issue-4 | April-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

USEFULNESS OF ALPHA BLOCKERS (TAMSULOSIN) AND ANTICHOLINERGIC (SOLIFENACIN) DRUGS IN MANAGEMENT OF URETERIC STENT RELATED SYMPTOMS

Surgery

Dr. Tejas Raiyani Surgery Resident, Department of Surgery, Bharati Vidyapeeth (DTU) Medical College, Pune

Dr. Pankaj Bansode* Associate professor, Department of Surgery, Bharati Vidyapeeth (DTU) Medical College, Pune *Corresponding Author

ABSTRACT

In the patients of ureteric stones, PCNL and hydronephrosis the use of ureteral stents is advised by the urologists. Stents are used to maintain ureteric patency and achieve free flow of urine, prevention of stricture following instrumentation. Patients with ureteric stent may present with symptoms like urgency, frequency, burning micturition, hematuria etc. The present study was conducted with an objective to determine and compare the effects of alpha blocker tamsulosin and anticholinergic drug solifenacin on the symptoms related to use of stents. The dose of drug Tamsulosin was 0.4 mg and that of solifenacin 5 mg and both were administered orally once a day for 14 days. The distribution of patients according relief to stent symptoms by Tamsulosin showed that majority of patients had relief from nausea and vomiting (33.33%), also the work performance was increased in 33.33% of patients, followed by dysuria (30%), urgency (26.67%), frequency (26.67%), nocturia (25%), pain (23.33%) and incontinence (23.33%). The distribution of patients according to relief to stent symptoms by Solifenacin showed that majority of patients had relief from urgency (53.33%), pain (26.67%) followed by frequency (25%), nausea & vomiting (25%), frequency (15%) and incontinence (11.67%). The difference in mean M-USSQ score pre-operative and after removal of stent was statistically significant. Irritative symptoms (frequency, dysuria, and urgency) may improve because of the alpha receptors blockage at the bladder trigone by tamsulosin, while solifenacin through its antimuscarinic effect shown to be useful in overactive bladder treatment.

KEYWORDS

Ureteral stent, Tamsulosin, Solifenacin

INTRODUCTION

One of the most common prosthetic devices used by the urologists are the “ureteral stents”. Ureteral stents are mostly used in obstructive uropathy, promote ureteral healing after surgery, and to help with ureteral identification during complex surgical procedure. Ureteral stent placement is not complication free. Some degree of morbidity in the form of generalized urinary discomfort is complained by the majority of patients. The ideal stent has yet to be discovered.1-3

Ureteral stents are essential tools in urology and most common indications for the use of ureteric stent are in treatment of ureteric stones, PCNL, hydronephrosis etc. Stents are used to maintain ureteric patency and achieve free flow of urine, prevention of stricture following instrumentation.[4]

Patients with ureteric stent may present with symptoms like urgency, frequency, burning micturition, hematuria etc. Etiological factors hypothesized for stent related symptoms include bacterial colonization, mechanical irritation of bladder trigone, improper placement. Strategies for managing stent complication include use of medication.[5-6]

In the literature effect of various drugs to relieve these symptoms has been noted, including intravesical chemical agents, alfusin, tolteradine, oxybutynin, tamsulosin.[7-10] Recently the alpha blockers like Tamsulosin and anticholinergic drugs like Solifenacin, has been utilized to get relief from the urinary symptoms, which are caused due to prostatic hyperplasia and overactive bladder.[5-6]

Tamsulosin is a selective alpha 1 receptor antagonist causing relaxation of the smooth muscle and therefore less resistance to urinary flow. Solifenacin is competitive antagonist to cholinergic receptor which is selective for subtype M3 receptor. In smooth muscles the binding of the acetylcholine to these receptor especially M3, has an important role in process of contraction.[6]

Because the symptoms of overactive bladder and related to use of stent are found to be similar, that is the reason to use these drugs in these patients. Hence the present study was conducted with an objective to determine and compare the effects of alpha blocker and anticholinergic on the symptoms related to use of stents.

MATERIAL AND METHODS

The present study was carried out in the Department of Surgery, Bharati Vidyapeeth (Deemed to be University) Medical College, Hospital and Research center, Pune. The study population comprised of total 120 patients with ureteric stenting and having Lower urinary tract symptoms, admitted in Department of Surgery after taking informed consent. The institutional ethical committee clearance was obtained for the study. The present study was carried out between the period of September 2016 to September 2018.

The patients above the age of 18 years were selected in the study group, with unilateral stenting and lower urinary tract symptoms. The patients with bilateral ureteral stents, ureteral stents fixation after open or laparoscopic surgery, the patients with presence of lower urinary tract symptoms before the fixation of stent were excluded from the study.

Methodology

All patients included in the study were administered in ureteric stent questionnaire and score noted. Then patients were randomly divided into two groups. On the basis of odd and even number of the IPD taking last two digits into consideration one group was given alpha blocker (Tamsulosin) and the other was given anticholinergic drug (Solifenacin). The dose of drug Tamsulosin was 0.4 mg and that of solifenacin 5 mg and both were administered orally once a day for 14 days.

Stent related symptoms questionnaire was administered again at time of removal of stent (mostly 3 weeks) to see relief or improvement of symptoms. Mini ureteric stent symptoms questionnaire: M –USSQ contains four categories of symptoms which include pain, voiding, work performance, general health feature. Each symptom is given 1 point and total score is fifteen.

Questionnaire Score: Yes – 1; No – 0

Statistical analysis:

The data was analyzed using SPSS (Statistical Package for social sciences) version 20.0 software. The data was presented as number and/or percentage (%). The quantitative variables were presented as Mean ± SD. The percentages between the groups were compared by chi-squared test. A two tailed paired and unpaired students 't' test was used to analyze the difference between the means of quantitative variables. The 'p' value of < 0.05 was considered as significant

RESULTS

The present study was carried out with the aim to Compare Alpha blockers (Tamsulosin) and Anticholinergic (Solifenacin) in management of ureteric stent related symptoms. It was observed that major symptom of pain was 58.33% in Group T and 78.33% in group S, which was higher significantly (p=0.0309) in group S than T. The

frequency was found to be significantly higher (p<0.0001) in group T (80%) compared to group S (38.33%). The presence of hematuria and dysuria was significantly higher (p=0.008 & p=0.0159 respectively) in group T patients as compared to group S patients. The side effects viz. fever and nausea & vomiting were also significantly (p=0.0022 & p=0.0002) more in group T patients than group S patients. The work performance was affected in more in group T significantly (p=0.0001) than group S patients. While, there was no statistical significant difference in urgency, incontinence, nocturia and malaise when two groups were compared statistically in respect to urinary symptoms. The distribution of patients according to urinary symptoms and their comparison between the two groups is depicted in table no. 1.

Table 1: Distribution of patients according to urinary symptoms

Urinary symptoms	Group T (n=60)	%	Group S (n=60)	%	P value
Pain	35	58.33	47	78.33	0.0309*
Urgency	51	85	42	70.00	0.0803
Frequency	48	80	23	38.33	<0.0001*
Incontinence	22	36.67	19	31.67	0.7003
Hematuria	31	51.67	16	26.67	0.008*
Nocturia	21	35	12	20.00	0.1019
Dysuria	24	40	11	18.33	0.0159*
Fever	21	35	06	10	0.0022*
Nausea & Vomiting	28	46.67	08	13.33	0.0002*
Work performance affected	32	53.33	10	16.67	0.0001*
Malaise	12	20	08	13.33	0.4621

* Statistically significant

The table 2 shows distribution of patients according to M-USSQ score by Tamsulosin and Solifenacin. The mean M-USSQ score pre-intervention and after removal of stent in group receiving tamsulosin was 7.62 ± 2.19, and 4.29 ± 1.29 respectively. This difference in M-USSQ score in patients was statistically significant. (P<0.0001). The mean M-USSQ score pre-intervention and after removal of stent in group receiving solifenacin was 5.13 ±1.79 and 1.32 ± 0.87 respectively. This difference in M-USSQ score in patients was statistically significant. (P<0.0001)

Table 2: Distribution according to M-USSQ score by Tamsulosin and Solifenacin

Time	Mean M-USSQ score	P value
Tamsulosin		
Pre- intervention	7.62 ± 2.19	<0.0001*
Removal of stent	4.29 ± 1.29	
Solifenacin		
Pre-intervention	5.13 ± 1.79	<0.0001*
Removal of stent	1.32 ± 0.87	

*Statistically significant

The difference in the means of M-USSQ score in pre-intervention group T (7.62 ± 2.19) and group S (5.13 ± 1.79) differed significantly. The means of M-USSQ score after removal of stent between group T (4.29 ± 1.29) and group S (1.32 ± 0.87) also differed significantly (<0.0001) between both the groups.

Table 3: Comparison of M-USSQ score among two groups

M-USSQ score	Group T (n=60) Mean ± SD	Group S (n=60) Mean ± SD	P value
Pre-intervention	7.62 ± 2.19	5.13 ± 1.79	<0.0001*
Removal of stent	4.29 ± 1.29	1.32 ± 0.87	<0.0001*
P value	**<0.0001***	**<0.0001***	

*Statistically significant

The table 4 shows distribution of patients according relief to stent symptoms by Tamsulosin and Solifenacin. In group receiving tamsulosin, the majority of patients had relief from nausea and vomiting (33.33%), also the work performance was increased in 33.33% of patients, followed by dysuria (30%), urgency (26.67%), frequency (26.67%), nocturia (25%), pain (23.33%) and incontinence (23.33%). In group receiving solifenacin, the majority of patients had relief from urgency (53.33%), pain (26.67%) followed by frequency (25%), nausea & vomiting (25%) and incontinence (11.67%)

Table 4: Distribution according to relief of stent related symptoms by Tamsulosin and Solifenacin

	Tamsulocin		Solifenacin	
Symptoms relief	**Patients (n=60)**	**%**	**Patients (n=60)**	**%**
Pain	14	23.33	16	26.67
Urgency	16	26.67	32	53.33
Frequency	16	26.67	15	25
Incontinence	14	23.33	7	11.67
Hematuria	23	38.33	6	10
Nocturia	15	25	5	8.33
Dysuria	18	30	3	5
Fever	10	16.67	1	1.67
Nausea & Vomiting	20	33.33	15	25
Work performance affected	20	33.33	3	5
Malaise	09	15	3	5

DISCUSSION

The present study was conducted to compare alpha blockers (Tamsulosin) and anticholinergic (Solifenacin) in management of ureteric stent related symptoms. The dose of drug Tamsulosin was 0.4 mg and that of solifenacin 5 mg and both were administered orally once a day for 14 days. Stent related symptoms questionnaire was administered again at time of removal of stent (mostly 3 weeks) to see relief or improvement of symptoms.

Lim KT et al[11] evaluated the roles, individually and in combination of tamsulosin and Solifenacin in patients indwelling the double-J stent, to improve the urinary symptoms. Pawar DS et al[12] studied effect of tamsulosin and solifinacin on stented patients.

In a study done by Lim KT et al[11] observed that out of total patients studied significant number of patients had stones present in lower part of the ureter, while compared to remaining patients who had the stone present at middle in ureter. The distribution of patients according to urinary symptoms among both groups showed that major symptom of pain was 58.33% in Group T and 78.33% in group S, which was higher significantly in group S than T. The frequency was found to be significantly higher in group T (80%) compared to group S (38.33%). The presence of hematuria and dysuria was significantly higher in group T patients as compared to group S patients. The side effects viz. fever and nausea & vomiting were also significantly more in group T patients than group S patients. The work performance was affected in more in group T significantly than group S patients. While, there was no statistical significant difference in urgency, incontinence, nocturia and malaise when two groups were compared statistically in respect to urinary symptoms.

In a study done by Pawar DS et al[12] non-significant difference in pain score among tamsulosin group and Solifinacin group, with no association of age and sex but patients showed major side effects of dry mouth in Solifinacin group.

In the present study the distribution of patients according relief to stent symptoms by Tamsulosin showed that majority of patients had relief from nausea and vomiting (33.33%), also the work performance was increased in 33.33% of patients, followed by dysuria (30%), urgency (26.67%), frequency (26.67%), nocturia (25%), pain (23.33%) and incontinence (23.33%). The distribution of patients according to relief to stent symptoms by Solifenacin showed that majority of patients had relief from urgency (53.33%), pain (26.67%) followed by frequency (25%), nausea & vomiting (25%), frequency (15%) and incontinence (11.67%). The difference in mean M-USSQ score pre-operative and after removal of stent was statistically significant.

An improvement in urinary symptoms, pain at voiding and flank pain was improved due to use of alpha-1 blockers in a study by Wang et al[13] In addition, similar effects were observed with use of tamsulosin by Damiano et al[14] in improvement of urinary symptoms.

The distribution of patients according to M-USSQ score in Solifinacin group showed that difference in the mean M-USSQ score between pre-intervention and after removal of stent was statistically significant. The difference in the means of M-USSQ score in pre-intervention group T and group S differed significantly. The means of M-USSQ score after removal of stent between group T and group S also differed significantly.

In a study done by Lim KT et al[11] observed that difference in M-USSQ score among patients in two groups was statistically not significant. In study of Damiano et al[14] showed that alpha blocker significantly decreases flank pain by causing ureteral relaxation. In study of Tehranchi et al[15] in Iran also showed significant decrease in pain and IPSS by alpha blocker and bladder relaxant in patient with stent after PCNL and trans urethral lithotripsy.

Alpha blockers, anticholinergics, or their combination is prescribed empirically. Significant reduction in peak contraction pressure, leading to ureteral dilation was observed due to alpha-blockers. Thus, alpha blockers by decreasing muscle spasm and intrarenal urinary reflux may indicate the usefulness of it in relief of flank pain. Irritative symptoms (frequency, dysuria, and urgency) may improve because of the alpha receptors blockage at the bladder trigone. Deliveliotis C et al.[8] were the first to demonstrate that Alfuzosin relieved the stent related symptoms, pain and improved sexual and general health. Beddingfield et al.[9] also concluded in their study that Alfuzosin 10mg daily improved frequency and flank pain. Similarly, Wang et al.[13] reported that Tamsulosin improved urinary symptoms and flank pain during voiding. More various trials have confirmed the efficacy of alpha blockers in relieving stent related symptoms, making alpha blockers the most commonly prescribed agents. Similarly in our study, Tamsulosin was effective in relieving urinary symptoms, body pain, general health, and work performance. Improvement in general health and work performance can be explained by decreased urinary and body pain symptom score.

Solifenacin through its antimuscarinic effect shown to be useful in overactive bladder treatment. The symptoms related to stents like LUTS, body pain and hematuria by alleviating bladder and ureteral spasm and retrograde pressure transmission to kidney are found to be improved by Solifenacin.

In study by Rana Ata ur Rehman,[16] significant reductions in IPSS total score was observed indicating the lowering of symptoms related to stents buy tamsulosin monotherapy. In another study conducted by Lee et al[17] showed the symptoms related to the use of double J stent were effectively reduced with the use of solifenacin postoperatively. Similarly Lim and his colleagues suggested the combinational use of these two drugs rather using either drug alone to reduce the symptoms related to use of double J stent.[12]

REFERENCES:

1. Chew BH, Knudsen BH, Denstedt D: The use of stents in contemporary urology. Curr Opin Urol 2004; 14:111-115
2. Byrne RR, Auge BK, Kourambas J, Munver R, Delvecchio F, Preminger GM: Routine ureteral stenting is not necessary after ureteroscopy and ureteropyeloscopy: a randomized trial. J Endourol. 2002;16(1):9-13
3. Joshi HB, Okeke A, Newns N, Keeley FX Jr, Timoney AG: Characterization of urinary symptoms in patients with ureteral stents. Urology 2002; 59:511-519
4. Miyaoka R, Monga M: Ureteral stent discomfort: Etiology and management. Indian J Urol 2009; 25:455-460
5. Damiano R, Autorino R, De Sio M, Giacobbe A, Palumbo IM, D'Armiento M: Effect of Tamsulosin in Preventing Ureteral Stent- Related Morbidity: A Prospective study. J Endourol. 2008; 22:651–655
6. Vardy MD, Mitcheson HD, Samuels TA, Wegenke JD, Forero-Schwanhaeuser S, Marshall TS, et al: Effects of solifenacin on overactive bladder symptoms, symptom bother and other patient reported outcomes. Int J Clin Prac. 2009; 63:1702-1714
7. Beiko DT, Watterson JD, Knudsen BE, Nott L, Pautler SE, Brock GB, et al: Double-blind Randomized Control Trial Assessing the Safety and Efficacy of Intravesical Agents for Ureteral Stent Symptoms after Extracorporeal Shockwave Lithotripsy. J Endourol 2004; 18:723-730
8. Deliveliotis C, Chrisofos M, Gougousis E, Papatsoris A, Dellis A, Varkarakis IM: Is there a role for alpha 1 -blockers in treating double-J stent-related symptoms? Urology, 2006; 67:35-39
9. Beddingfield R, Pedro RN, Hinck B, Kreidberg C, Feia K, Monga M: Alfuzosin to Relieve Ureteral Stent Discomfort: A Prospective, Randomized, Placebo Controlled Study. J Urol 2009; 181:170-176
10. Park SC, Seo IY, Jeong HJ, Oh SJ, Rim JS, Jeong YB: The effect of alfuzosin and tolterodine in treating double-J stent-related symptoms. J Urol, 2008; 179:289
11. Lim KT, Kim YT, Lee TY, Park SY: Effects of tamsulosin, solifenacin, and combination therapy for the treatment of ureteral stent related discomforts. Korean J Urol. 2011; 52(7):485-488
12. Pawar DS, Kumar A, Benjwal S, Mittal S, Lal J, Khandelwal A et al: Comparative study to evaluate effect of tamsulosin and Solifenacin on DJ stent related symptoms. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), 2016; 15(10):34-37
13. Wang CJ, Huang SW, Chang CH: Effects of tamsulosin on lower urinary tract symptoms due to double-j stent: A prospective study. Urol Int 2009; 83:66–69
14. Damiano R, Autorino R, De Sio M, Cantiello F, Quarto G, Perdonà S et al. Does the size of ureteral stent impact urinary symptoms and quality of life? A prospective randomized study. Eur Urol. 2005;48(4):673–678.
15. Tehranchi A, Rezaei Y, Khalkhali H, Rezaei M: Effects of terazosin and tolterodine on ureteral stent related symptoms: a double-blind placebo-controlled randomized clinical trial. Int Braz J Urol. 2013; 39(6):832-840
16. El-Nahas AR, Tharwat M, Elsaadany M, Mosbah A, Gaballah MA: A randomized controlled trial comparing alpha blocker (tamsulosin) and anticholinergic (solifenacin) in treatment of ureteral stent related symptoms. World J Urol 2016; 34: 963–968
17. Lee SJ, Yoo C, Oh CY, Lee YS, Cho ST, Lee SH et al: Stent position is more important than α-blockers or anticholinergics for stent-related lower urinary tract symptoms after ureteroscopic ureterolithotomy: a prospective random−ized study. Korean J Urol. 2010; 51(9):636–641