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Original Article

Role of Tamsulosin and Solifenacin to Reduce Double J Stent Related Symptoms After Uncomplicated Ureteroscopic Lithotripsy

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ABSTRACT

Introduction: Endoscopic urological surgeries are safe procedures with further reduction in morbidity due to double J stents. Stents usually give rise to lower urinary tract symptoms and various drugs have been prescribed singly or in combination to ameliorate the symptoms. Since double J stenting of the ureter is one of the most common procedures in our department, we attempted to compare the efficacy of anti-muscarinic drug Solifenacin over alpha-blocker Tamsulosin.

Materials and methods: A prospective study was done where 50 consecutive patients who underwent double J stenting following ureteroscopic lithotripsy were randomized and given 5 mg Solifenacin or 0.4 mg Tamsulosin. Lower urinary tract symptoms were assessed at end of first and second week. The results were analyzed.

Conclusions: Lower urinary tract symptoms are common and quite bothersome following DJ stent insertion. The symptoms can be ameliorated with the use of alpha blockers and anti-muscarinic drugs.

Keywords: Alpha blockers; Anticholinergic; Anti-muscarinic; Double J stents; IPSS score

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INTRODUCTION

The first surgeon who stented the ureter was Simon and Zimskind first reported endoscopic stenting in 1967.[1] Stent migration and spontaneous expulsion were the problems faced initially, which was solved by Finney and Hepperlen by introduction of double J (DJ) or double pigtail stent.[2-4] Although DJ stenting is one of the most common procedures in urology, morbidity associated with it is a potential health problem varying from commonly experienced stent related symptoms to serious issues like forgotten stent.[5] DJ stent- related symptoms are frequency (50–60%), sexual dysfunction (male, 42–82% and female, 30–86%), reduced work capacity (58%), urgency (57–60%), dysuria (40%), flank pain (19–32%), incomplete emptying (76%), suprapubic pain (30%) hematuria (25%) and reduced quality of life (QOL) in approximately 80% of the patients. [4-8]

The pathophysiology of these stent related symptoms are still not clear and various theories have been proposed like ureteral smooth muscle spasm or distal curl of the stent that may lead to bladder mucosal/trigonal irritation and urinary reflux which can be responsible for these symptoms.[9,10] The likely cause is not one, but a combination of these hypothesis. Various tools have been used for assessment of stent related symptoms. Although nonspecific, still the International Prostate Symptom Score (IPSS) is widely used for the assessment of stent-related symptoms (SRSs) because of its familiarity with urologists. Joshi et al. have developed a self-administered validated Ureteral Stent Symptom Questionnaire (USSQ) to objectively evaluate SRS and associated impact on QOL.[10-12]

Various attempts have been made to minimize these symptoms, pharmacological treatment being the simplest and a noninvasive option. Numerous drugs have been tried to relieve these symptoms like alpha blockers, anticholinergics, phosphodiesterase inhibitors (PDE5Is) and analgesics.[13-26] Silodosin is a highly selective alpha-1 adrenergic receptor antagonist which is used in the treatment of lower urinary tract symptoms (LUTS). Alpha-1 adrenergic receptors are densely found in the smooth muscle cells of the lower urinary tract, and alpha blockers antagonises and relaxes them to improve the symptoms, and various studies have also shown similar effect.[13-21] Anticholinergics can also improve symptoms by reducing the involuntary bladder contraction that occurs due to trigone irritation.[18-25] PDE5Is increase levels of cGMP that will lead to relaxation of the smooth muscle of ureter and reduces symptoms.[6-26]

Ureteroscopic lithotripsy is one of the most commonly performed procedures in our department and DJ related symptoms is the most commonly encountered problem in post-operative period. The aim of this study is to evaluate the efficacy and safety of anticholinergic agent Solifenacin in reducing DJ stent-related LUTS. Alpha blocker, Tamsulosin, has been the drug of choice we have been using and this study aims to compare the efficacy of Solifenacin over Tamsulosin.

MATERIALS AND METHODS

This prospective observational study was conducted for the period of 3 months in Department of Urology of Bir Hospital from Jestha to Srawan 2078. Fifty consecutive patients with ureterolithiasis who underwent ureteroscopic lithotripsy for ureteral stones were included in the study. Patients not consenting to study, age below 14 years, patients with positive urine culture, those who underwent bilateral procedures or simultaneous procedures for urinary tract pathology, bladder co - morbidity e.g. cystitis, neurogenic bladder, abnormal preoperative IPSS score, incomplete stone fragmentation or retrograde migration of stone were excluded from the study.

Pre-operatively patients were assessed in Urology OPD of Bir Hospital. Demographic parameters of the patients, history, and physical examination were recorded. The patients underwent routine preoperative investigations and a pre anaesthetic check-up. Consecutive 50 patients fulfilling the inclusion criteria were studied, after randomizing them into two groups where one received Solifenacin at discharge and other got Tamsulosin.

All data were collected by a single observer. Patients were counseled about the study and a written informed consent was taken. Preoperative IPSS score was recorded. Patients were admitted in the morning of operation. One-gram Ceftriaxone was given one hour before procedure. All procedures were done under spinal anaesthesia. 6/7.5 Fr. ureteroscope was used to access the ureter transurethrally and stone identified. Either a ballistic pneumatic lithotripter or laser was used for lithotripsy. Stone fragments were removed with grasping forceps and removed either into the bladder or externally. A hydrophilic guide wire was inserted up to kidney and a 6 Fr, 26 cm, both end open, polyglactin double J stent was inserted over the guide wire.

The patients were discharged next morning. On discharge, tablet Cefixime 200 mg for 5 days and tablet Ketorolac 10 mg for 3 days were prescribed. Twenty five patients in each group were randomized by computer generated randomization (www.randomizer.org). Solifenacin group were provided 5mg Solifenacin at bedtime and the second group were advised 0.4 mg Tamsulosin at bedtime.

All patients were phoned at end of one week for symptom assessment. Assessment was done with IPSS questionnaire. All patients were asked to come for follow up at two weeks postoperatively for DJ stent removal. IPSS scoring was done again for symptoms assessment.

RESULTS

Fifty consecutive patients who underwent ureteroscopic lithotripsy were enrolled in the study. At the time of discharge, 25 of them were randomly prescribed Solifenacin and 25 were prescribed Tamsulosin based on computer generated randomization. Table 1 shows the demographic and clinical characteristics of the two groups, which are statistically comparable.

Table 1: Patient demographic and clinical characteristics

Variables		Solifenacin	Tamsulosin	p-value
No. of pts		25	25	
Mean age ± SD		34 ± 8	31 ± 9	0.2189
Male		12	11	
Female		13	14	
Laterality	**Left**	8	11	0.56
	Right	17	14	
Mean IPSS score ± SD		1.80 ± 0.36	1.88 ± 0.32	0.4104
Mean stone size (mm²) ± SD		38.02 ± 13.73	41.15 ± 11.82	0.3920
Mean HU ± SD		862 ± 278	768 ± 122	0.1282
Mean operative time (min) ± SD		31.24 ± 8.45	34.48 ± 7.38	0.1552

The patients were discharged with medications on the first postoperative day and depending upon the computer randomization, 25 were prescribed Solifenacin and 25 were prescribed Tamsulosin. These patients were phoned after a week and query made about their DJ related symptoms, the scoring of which was done according to the IPSS scoring system. The symptoms were again assessed when patients presented for DJ removal. The summary of the symptoms is presented in Table 2.

Table 2: Comparison of DJ Stent related symptoms

	Solifenacin	Tamsulosin	p-value
First week increment in IPSS score from baseline (preoperative)	7.1786 ± 1.321	6.2692 ± 1.166	0.0130
Second week increment in IPSS score from baseline (preoperative)	5.6429 ± 1.085	5.6429 ± 1.085	0.0602

It was observed that the IPSS score was higher in the Solifenacin group, compared to Tamsulosin group in both the first and second weeks, being significantly higher in the first week. The IPSS score reduced in the second week in both the groups, and although it was still higher in Solifenacin group, it was statistically not significant. The reduction of symptoms within the first and second week in both the groups was clinically significant, Solifenacin group being p <0.0001 and Tamsulosin group being 0.0004. None of the patients in both the groups had to be readmitted nor DJ stents had to be removed prematurely for DJ related symptoms.

DISCUSSION

Ever since the introduction of double J stents, endoscopic urological surgeries have been safe procedures with reduction in morbidity. However, DJ stents are not without any problems, storage lower urinary tract symptoms being the major complaints from the patients. Various drugs have been prescribed as single drug or in combination to ameliorate the symptoms; alpha blockers, antimuscarinics, beta agonists and phosphodiesterase inhibitors being the most common. Since no one drug or a combination have been proved to be superior and no definite symptom scoring has been universally accepted, various literatures have different results. We attempted to compare the efficacy of antimuscarinic drug Solifenacin over alpha blocker Tamsulosin.

In 2011 Lim et al[18], from a study of 168 patients suggested that combination therapy with Tamsulosin and Solifenacin improved both irritative and obstructive symptoms. Po Chau Sai et al in 2015 [13] did a prospective study including 158 patients who underwent insertion of a double-J ureteral stent. They compared Silodosin with placebo and concluded that Silodosin improved a subset of stent-related urinary symptoms including pain, voiding flank pain, and quality of life. Bhattar et al in 2018[27] extensively studied on 335 patients who underwent DJ stenting. They divided the patients into 8 different groups with Silodosin, Tadalafil and Solifenacin used in combination and singly. They also had a placebo group to validate the findings. They concluded that combination therapy with silodosin and solifenacin was effective for relieving stent related symptoms with improved quality of life and less requirement of analgesic.

Meta-analysis done by Liang Zhou et al in 2015[7] included 13 articles comprising of 1408 patients. Their data showed the beneficial effect of α-blockers alone and antimuscarinics alone in reducing stent-related symptoms. Furthermore, they suggested significant advantages of combination therapy of alpha blocker and antimuscarinic compared with alpha blocker monotherapy.

We observed that lower urinary tract symptoms are common following DJ stenting. Both Solifenacin and Tamsulosin are effective to reduce these symptoms, Tamsulosin being superior. However, in both the groups, we found that the symptoms reduced significantly from the first to the second week.

CONCLUSIONS

Lower urinary tract symptoms are common and quite bothersome following DJ stent insertion. The symptoms can be ameliorated with the use of alpha blockers and antimuscarinic drugs. Further studies with larger number of patients and combination of drugs are recommended.

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