International Surgery Journal
Parikh C et al. Int Surg J. 2019 Mar;6(3):982-988
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20190835

Original Research Article

Tamsulosin versus tadalafil as medical expulsive therapy of distal ureteric stones: a comparative study

Chirag Parikh[1], Vipul Gurjar[2]*, Sneh Shah[2]

[1]Department of Surgery, GMERS, Gotri Medical College, Vadodara, Gujarat, India
[2]Department of Surgery, Sbks MIRC, Sumandeep Vidyapeeth, Vaghodia, Gujarat, India

Received: 29 July 2018
Revised: 22 November 2018
Accepted: 11 December 2018

***Correspondence:**
Dr. Vipul Gurjar,
E-mail: dr.vipulgurjar@yahoo.com

ABSTRACT

Background: The management of patients with ureteral calculi has changed dramatically in the current era, with the conservative approach being the primary focus, its main benefit being minimum patient morbidity. The use of the expectant approach for distal ureteric stones can be extended with the use of adjuvant medical expulsive therapy (MET), which is able to reduce symptoms and facilitate stone expulsion. The present study was thus conducted to determine single best monotherapy for medical expulsive therapy of distal ureteric stones by comparing Tadalafil and Tamsulosin.
Methods: A hospital based comparative study was conducted at Department of Surgery of a tertiary care hospital. A total of 60 eligible cases of lower uretric calculus were included in the study. These 60 patients were then divided into 2 groups of 30 each to receive one of the two medical therapy i.e. Tadalafil and Tamsulosin.
Results: Mean expulsion of calculi was significantly earlier in patients managed by tadalafil as compared to tamsulosin (13.1 vs 16.92 days; $p<0.05$). Complete expulsion was seen in 86.7% cases on tadalafil as compared to only 63.3% cases on tamsulosin ($p<0.05$). Mean analgesic use (2.69 vs 1.81; $p<0.05$) and episodes of colicy pain (1.41 vs 0.43; $p<0.05$) were significantly higher in patients managed by tamsulosin. The number of hospital visits required during treatment was also more with tamsulosin, but the difference did not reach significance levels (2.56 vs 2.02 days; $p=0.06$). No difference was seen in the adverse effect profile of both drugs.
Conclusions: Tadalafil also provides early stone expulsion, a greater decrease in colicky pain episodes, and a greater decrease in analgesic requirement. Both drugs are safe, effective, and well tolerated with minor side effects. Thus tadalafil is safe, efficacious, and well tolerated as medical expulsive therapy for distal ureteric stones.

Keywords: Lower uretric calculi, Medical expulsive therapy, Tadalafil, Tamsulosin

INTRODUCTION

The formation of stone in the urinary system, i.e., in the kidney, ureter, and urinary bladder or in the urethra is called urolithiasis. 'Urolithiasis' =ouron (urine) and lithos (stone). Urolithiasis is one of the major diseases of the urinary tract and is a major source of morbidity. Stone formation is one of the painful urologic disorders that occur in approximately 12% of the global population and its re-occurrence rate in males is 70-81% and 47-60% in female. It is assessed that at least 10% of the population in industrialised part of the world are suffering with the problem of urinary stone formation.[1]

Ureteric calculi or stones are those lying within the ureter, at any point from the ureteropelvic junction (UPJ) to the ureterovesical junction (UVJ). They are the classic cause of renal colic-type abdominal pain. They are a subset of the broader topic of urolithiasis.

Patients with ureteric calculi may present with peristaltic pain (renal colic), haematuria, nausea and vomiting. The quality and location of pain is dependent on the location of the calculi within the ureter. Calculi within the ureteropelvic junction may cause deep flank pain due to distension of the renal capsule, without radiation to the groin, whereas pain from upper ureteral calculi radiates to the flank and lumbar areas. Calculi in the mid-ureter result in pain radiating anteriorly, while pain from distal ureteric calculi radiates to the groin via referred pain from the genitofemoral or ilioinguinal nerves. Calculi in the ureterovesical junction may also cause irritative voiding symptoms such as dysuria and urinary frequency.[2]

Each year throughout the world, people make more than a million visits to healthcare providers and to emergency rooms for urinary stone problems. The increasing prevalence of ureteric stones is a matter of concern in this era, and it could be linked to improved quality of life. The incidence varies, with geographical location being higher in the Middle East, western India and southern USA, which probably reflects the water and soil content as well as the hot weather and dehydration that exist in these areas. Renal stones are most common in middle-aged people, and are threefold more common in men than women. A total of 22% of all urinary tract stones are found in the ureter, of which 68% are seen in the distal ureter. Colicky pain is an initial presentation of ureteric stones, and almost half of the patients present within 5 years of occurrence of calculi. Most patients present between ages 30 and 60, with peak incidence between ages 35-45.[3]

Ureteral stones induce ureteral spasms that interfere with stone expulsion. Thus, reducing these spasms while maintaining normal peristaltic activity can facilitate stone expulsion. Almost 50% of ureteral stones will pass spontaneously over time and stone size is the key factor for success. Usually, stones smaller than 5 mm are expected to pass spontaneously, whereas only 20% of stones larger than 8 mm will pass. The best treatment modality depends upon various factors such as size, localization and composition of the stone, severity of obstruction, symptoms, and anatomy of the urinary system. The watchful waiting approach can result in complications, such as infection of the urinary tract, hydronephrosis, and deranged renal function. Ureteric stones have been treated traditionally with interventional techniques like ureteroscopy or open surgery.

Improvements in minimally invasive procedures in the last few decades have considerably changed the treatment of ureteral stones, but such procedures are not free of risks and are costly as well. A conservative approach through medical expulsive therapy (MET) as a supplement to conservative treatment has now become an established treatment modality that employs various drugs acting on the ureter by different mechanisms.

The ureter is lined by smooth muscle cells with alpha-1 adrenergic receptors, especially in the distal third. Receptor blockade inhibits both basal smooth muscle tone and hyper peristaltic uncoordinated frequency in order to maintain tonic propulsive contractions. Ureteric calculi can induce ureteric spasms that interfere with expulsion; thus, muscle relaxation while maintaining normal peristaltic activity may facilitate passage. Ureteric stones at the impaction site produce noticeable pathological changes; that is, an intense inflammatory reaction with mucosal oedema that could further worsen the ureteric obstruction, increasing the risk of impaction and retention.

Tadalafil has the longest duration of action (~36 hours) among the current PDE5 inhibitors. Although tadalafil has been used in the treatment of erectile dysfunction (ED) and lower urinary tract symptoms due to benign prostatic hyperplasia (BPH), its use in MET for ureteral stones is very limited in the Indian population. On the other hand, tamsulosin has been widely used for ureteral stones in our practice and has been found to be efficacious. This study aimed to analyze the safety and efficacy of tadalafil in distal ureteral stones and also to compare the efficacy of tadalafil with that of tamsulosin. Thus, by comparing drugs acting through different mechanisms, we aim to discover whether we can achieve better ureteric relaxation and reduction in intramural pressure in order to facilitate stone passage. Thus our main aim of comparing tadalafil and tamsulosin is to determine single best montherapy for medical expulsive therapy of distal ureteric stones.

METHODS

The present study is a prospective, randomized controlled trial. Between from the date of approval upto September 2017. After taking the consent from all the patients, each enrolled patient will be assessed by physical examination, serum creatinine, urine culture, X-Ray KUB, ultra-sonography and CT-IVP of the kidneys, ureters and bladder region as required and then 60 patients will be selected applying inclusion-exclusion criteria. These patients will be divided into two groups each of 30 patients, based on odd and even number of presentation. Patients in group A (odd no) will be given tamsulosin 0.4 mg once daily, and those in group B (even no) will be given tadalafil 10 mg once daily.

Inclusion criteria

Both genders aged greater than 20years Patients having ureteral calculi located in lower ureter calculi measures 10 mm and less.

Exclusion criteria

Pregnant women or nursing mothers, patients with febrile UTI or severe hydronephrosis, hydroureter or ulcerative disease or hypotension, severe hepatic dysfunction (e.g. hepatic cirrhosis, hepatic failure), α-blockers or α/β blockers or CCB or steroid. Patients whose urinary tracts

are anatomically deformed or stenosed, who underwent invasive operation on their ureter before, whose blood creatinine levels are 2 mg/dl and over. Patients who are hypersensitive to drugs**,** Patients having Complex stone**,** severe clinical symptoms, with co morbid condition.

Patients will be instructed to take plenty of fluids, to take adequate analgesic orally during episodes of pain and filter their urine by using a standard mesh net to detect stone expulsion. The patients were given treatment for a maximum period of 3 weeks or early till stone expulsion. Expulsion of the stone was confirmed with CT-IVP. Follow up is done in weekly intervals and data were recorded in a specially designed proforma. Stone expulsion rate, time to stone expulsion, analgesic use, number of hospital visits for pain, follow up, and adverse effects of drugs were recorded. It was transfer to a master chart then subjected to statistical analysis.

Data were statistically described in terms of mean (±SD), frequencies (number of cases) and percentages when appropriate. Data were tested first for normal distribution by Klomogorov– Smirnov test. Comparison of quantitative variables between the study groups was done using Student t test for independent samples if normally distributed. Mann–Whitney U test was used for non-normally distributed quantitative data. For comparing categorical data, Chi square test was performed. Exact test was used instead when the expected frequency is less than 5. All statistical calculations were done using computer programs Microsoft Excel 2007 (Microsoft Corporation, NY, USA) and SPSS (Statistical Package for the Social Science; SPSS Inc. Chicago, IL, USA) version 21.

RESULTS

Most common age group affected by lower ureteric calculus was between 31-40 years. Amongst that 55%, 63.3% were in tadalafil group and 46.7% were in tamsulosin group (Table 1). This showed the male prepondrance in the study population. It can be due to males working out in fields in hot environment which leads to dehydration. The quality of water can also affect the study population.

Pain in lower abdomen was found in 88% (n=53) of which 83% were from tadalafil group and 93% from Tamsulosin group. Patients presenting with complaints of burning micturation were 60% and 70% respectively in tadalafil and tamsulosin group (Table 2).

Out of 60 patients 88% (n=53) had radio-opaque shadow on x-ray KUB. In tadalafil group 83.3% had opacity on x-ray-KUB and 13.3% didn't had while in tamsulosin group 93.3% of patients had opacity on x-ray-KUB and 10% didn't had. 90% of the patients had calculus on USG with decreasing percentage of patients having hydroureter and hydronephrosis i.e. 56.7% and 13.3% respectively. Calculus was seen in 93.3% of tadalafil group and 86.6% of tamsulosin group. 46.66% and 66.66% had hydroureter in tadalafil and tamsulosin group respectively. Hydronephrosis was seen in 16.66% in tadalafil group and 10% in tamsulosin group (Table 3).

Table 1: Comparison of demographic distribution in study groups.

	Group		Total
	Tadalafil	Tamsulosin	
	N (%)	N (%)	N (%)
Age group (years)			
21-30	4 (13.3)	7 (23.3)	11 (18.3)
31-40	19 (63.3)	14 (46.7)	33 (55.0)
41-50	4 (13.3)	7 (23.3)	11 (18.3)
51-60	2 (6.7)	2 (6.7)	4 (6.7)
> 60	1 (3.3)	0 (0.0)	1 (1.7)
Total	30 (100.0)	30 (100.0)	60 (100.0)
P value=0.49			
Gender			
Female	9 (30.0)	8 (26.7)	17 (28.3)
Male	21 (70.0)	22 (73.3)	43 (71.7)
Total	30 (100.0)	30 (100.0)	60 (100.0)
P value=1.0.			

Table 2: Comparison of study groups based on presenting complaints.

Presenting complaints	Group		Total
	Tadalafil (n=30)	Tamsulosin (n=30)	
	N (%)	N (%)	N (%)
Pain in lower abdomen	25 (83)	28 (93)	53 (88)
Burning micturation	18 (60)	21 (70)	39 (65)
Hematuria	3 (10)	4 (13)	7 (12)
Nausea/vomiting	7 (23)	5 (17)	11 (18)

Table 3: Distribution of subjects as per opacity on x-ray-KUB and USG findings.

Opacity on x-ray	Group		Total
	Tadalafil	Tamsulosin	
	N (%)	N (%)	N (%)
Yes	25 (83.33)	28 (93.30)	53 (88)
No	4 (13.33)	3 (10)	7 (23.33)
Ultrasound findings			
Calculus	28 (93.33)	26 (86.66)	54 (90)
Hydroureter	14 (46.66)	20 (66.66)	34 (56.70)
Hydronephrosis	5 (16.66)	3 (10)	8 (13.30)

No significant difference was observed between the study groups with respect to mean stone size (p=0.54). Mean expulsion of calculi, use of analgesics and Episodes of

colicy pain was significantly earlier in patients managed by tadalafil as compared to tamsulosin (p<0.05).

The number of hospital visits required during treatment were also more with tamsulosin showing than tadalafil so difference did not reach significance levels (2.56 vs 2.02 days; p=0.06) (Table 4).

Table 4: Comparison of study groups on stone.

	Group	Mean	SD	P value
Stone size (mm)	Tadalafil	7.21	1.55	0.54
	Tamsulosin	7.28	1.28	
Expulsion Time (days)	Tadalafil	13.10	3.99	<0.05
	Tamsulosin	16.92	4.21	
Analgesic use	Tadalafil	1.81	0.54	<0.05
	Tamsulosin	2.69	0.73	
Colic episodes	Tadalafil	0.43	0.79	<0.05
	Tamsulosin	1.41	0.88	
Hospital visits	Tadalafil	2.02	0.90	0.06
	Tamsulosin	2.56	0.70	

Table 5: Comparison of study groups based on complete stone expulsion rate.

Complete Expulsion	Group		Total
	Tadalafil (n=30)	Tamsulosin (n=30)	
	N (%)	N (%)	N (%)
Yes	26 (86.7)	19 (63.3)	45 (75.0)
No	4 (13.3)	11 (36.7)	15 (25.0)
Total	30 (100.0)	30 (100.0)	60 (100.0)

P value <0.05.

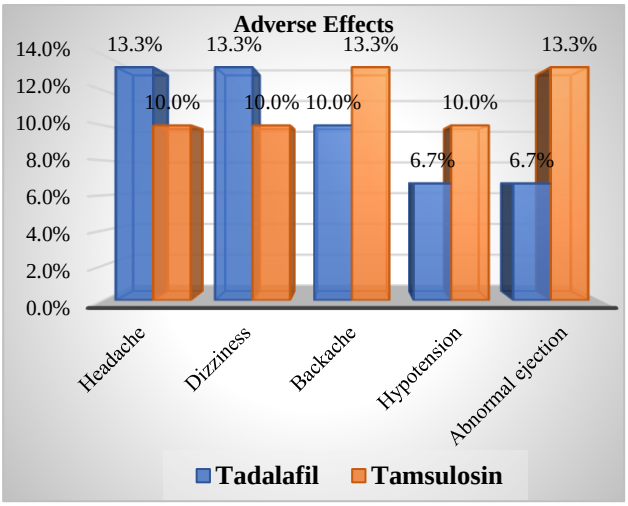

Figure 1: Graph showing adverse effects among study groups.

Complete expulsion by the end of 1 month was seen in 75% of patients out whole study population. 86.7% cases on tadalafil as compared to only 63.3% cases on tamsulosin out of 30 patients each had complete explusion of stone at the end of 1 month. P value (p<0.05) was found to be significant showing the better activity of tadalafil on tamsulosin (Table 5).

The various side effects noted during the study period in patients on Tadalafil and tamsulosin group were headache (13.3% vs 10%), dizziness (13.3% vs 10%), backache (10% vs 13.3%), hypotensive episodes (6.7% vs 10%) and abnormal ejection (6.7% vs 13.3%). No difference was seen in the adverse effect profile of both drugs (Figure 1).

DISCUSSION

The advances in minimally invasive techniques have led to a decrease in the treatment related morbidity associated with management of ureteric calculi. These advances include shock wave lithotripsy and ureteroscopic lithotripsy. Although these approaches are less invasive than traditional open surgical methods, they are expensive and have inherent risks. Hence, observation has been advised for small ureteral stones, which have a high probability to pass spontaneously. The use of the expectant approach for distal ureteric stones can be extended with the use of adjuvant medical expulsive therapy (MET), which is able to reduce symptoms and facilitate stone expulsion.

The factors influencing expulsion of calculi include stone size, shape, and location, ureteric edema, and ureteric convolutions. Of these, the location of the calculus and its size are the most important factors.

The management of patients with ureteral calculi has changed dramatically in the current era, with the conservative approach being the primary focus, its main benefit being minimum patient morbidity. Conservative nonsurgical approaches are usually implemented in the treatment plan of distal ureteral stones of size 5-10 mm as these are less likely to pass spontaneously. According to earlier studies, the expulsion rate of distal ureteric stone by watchful waiting is 25–54% with mean expulsion time >10 days and is associated with high analgesic requirement even for stones <5 mm. To improve the expulsion rate and reduce analgesic requirement, medical therapy is considered for distal ureteral stones.[4,5]

The present study was thus conducted to determine best treatment for medical expulsive therapy of distal ureteric stones by comparing Tadalafil and Tamsulosin.

Age comparison

>50% of the cases in present study were between 31-40 years of age with 6.7% and 1.7% cases between 51-60 years and above 60 years of age. Mean age of the study subjects was 37.1 ± 10.97 years (Table 1). According to the study done by Puvvada et al The mean age of patients having uretric stones was 36.94 years.[6] Bahadur et al study had 31.72 as a mean age of patients having uretric

stones.[7] The study done by Girish et al and Jayant et al showed mean age of 36.47 and 36.84 respectively.[8,9] The maximum mean age was seen in Kumar et al – 37.82 years which is approximately same as the present study (37.1 years).[10] Our results are in accordance with the past literature where most cases of uretric calculus were in their 4th decade of life. Most of the patients affected are in age group of 31-40 years which can be because of the young working people who have decrease amount of water intake in there day to day life (Table 1).

Gender comparison

Male predominance was seen in present study with 71.7% males to 28.3% females (Table No: 1). The percentage of male & female in Puvvada et al was 69.5% vs 30.5% while with Bahadur et al; Jayant et al and Girish et al showed 61.9% of male vs 38.1% of females; 54.1% of males vs 45.9% of females and 65.6% of males vs 34.4% of females respectively.[6-9] Our results are in accordance with the past literature where males were generally more affected than females.

This showed the male preponderance in the study population. It can be due to males working out in fields in hot environment which leads to dehydration. The quality of water can also affect the study population.

Presenting symptoms

Most common presenting complaints were pain in lower abdomen (88.3%) followed by burning micturition (65%), nausea/ vomiting (18.3%) and hematuria (11.7%) (Table 6).

Table 6: Presenting complain comparison.

Complaints	Present study (%)	Kumar et al[10] (%)	Jayant et al[9] (%)
Pain in lower abdomen	88.3	93.0	100.0
Burning micturation	65.0	56.0	51.0
Hematuria	11.7	3.0	
Nausea/ vomiting	18.3	11.0	17

Various studies have shown that colicky pain in the flank and ipsilateral lower abdomen with radiation to the testicles or the vulvar area is a characteristic feature of ureteric calculus. In most of the cases pain in lower abdomen is the only presenting complaint.

Pain in lower abdomen is seen as major complaint in such patients as the stone of >5 mm while propulsion pass through the ureter which is of maximum 5 mm diameter and so causing spasmodic pain and due the passage of stone the epithelium lining of the ureter gets abraded due to which haematuria occurs. Burning micturation occurs due to the infection. Nausea and vomiting are also because of the unbearable pain and infection.

Stone size

Most of the cases in present study had calculi measuring between 5-10 mm with mean size in cases of tadalafil and tamsulosin group as 7.21 mm and 7.28 mm respectively (Table 7). The comparison of stone size as observed in the studies by other authors is as follows:

Table 7: Stone comparison.

Author	Tadalafil (%)	Tamsulosin (%)
Stone size (mm)		
Puvvada et al.[6]	7.11	7.22
Bahadur et al.[7]	7.09	7.13
Girish et al.[8]	6.26	6.16
Present study	7.21	7.28
Stone expulsion		
Puvvada et al.[6]	14.70	16.80
Bahadur et al.[7]	8.71	9.64
Girish et al.[8]	4.05	4.14
Present study	13.10	16.92
Expulsion rate		
Puvvada et al.[6]	84.0	68.0
Bahadur et al.[7]	84.1	61.0
Kumar et al.[10]	66.7	64.4
Girish et al.[8]	73.0	70.0
Present study	86.7	63.3
Analgesic use		
Bahadur et al.[7]	120.40	146.00
Girish et al.[8]	406.60	476.70
Present study	181.00	269.40
Colicky episode		
Puvvada et al.[6]	0.45	1.30
Bahadur et al.[7]	0.64	0.80
Present study	0.43	1.41
Hospital visits		
Puvvada et al.[6]	2.10	2.40
Present study	2.02	2.56

According to the European Association of Urology Guidelines (2015) on Urolithiasis, there exists a high likelihood of spontaneous passage of stones up to ~5 mm, hence MET is less likely to increase the stone-free rate. The best results from MET were seen in cases with size ranging from 5-10 mm. Stone size larger than 10 mm doesn't pass through ureter thus most of the patients with uretric calculi presented to us and in other study with colicky pain with mean stone size 7.2 mm.

Stone expulsion time

Mean expulsion time of calculi in the present study was significantly earlier in patients managed by tadalafil as compared to tamsulosin (13.1 vs 16.92 days; $p<0.05$) in

comparision with other studies on table-7. Present study shows similar findings as of in study done by Puvvada et al & Bahadur et al.[6,7]

Tadalafil is PDE5 inhibitor which are abundant in ureter leading to more smooth muscle relaxation than Tamsulosin whose effect are sympathetic nervous system mediated on blocking of alpha 1 A and 1 D receptors which are more in distal ureter thus less expulsion rate by tamsulosin.

Stone expulsion rate

Complete expulsion was seen in 86.7% cases on tadalafil as compared to only 63.3% cases on tamsulosin ($p<0.05$). According to the Puvvada et al and Bhadur et al the expulsion rate of lower uretric stone was significantly higher in tadalafil group than in tamsulosin group was also seen in present study.[1,2] Jayant et al in their study compared the stone expulsion rate of tamsulosin with the tamsulosin and tadalafil combination. The expulsion rate was 74.2% versus 83.9% ($p=0.349$) and 65.5% versus 83.6% ($p=0.031$), respectively.[5] In another study, Hasan et al found that tadalafil had an expulsion rate of 93% compared with 67% for a placebo group.[10] The rate of expulsion was observed to be significantly faster with Tadalafil in most of the studies.[1-5]

Tadalafil is PDE5 inhibitor which are abundant in ureter leading to more smooth muscle relaxation than Tamsulosin whose effect are sympathetic nervous system mediated on blocking of alpha 1 A and 1 D receptors which are more in distal ureter thus Tamsulosin taking more time than tadalafil.

Analgesic use and colicky episodes comparision

Mean analgesic use (269.4 vs 181.0 mg; $p<0.05$) was significantly higher in patients managed by tamsulosin. Bahadur et al showed less use of analgesic in tadalafil group (120.40) vs (146.0) in tamsulosin group.[2] In the study done by Girish et al the use of analgesic was just little less in tadalafil group (406.60) than in tamsulosin group (476.70).[4] The mean analgesic use was less compared to Tamsulosin group in Tadalfil group in Bahadur et al and in Girish et al which corresponds with the results of presnt study.

Colicky pain is due to increased intra-ureteral pressure. Alpha blockade by Tamsulosin blocks C fibre mediated pain which are more concentrated in lower ureter while PDE5 mediated tadalafil causes dilatation of whole of ureter thus decreases intraluminal pressure and faster expulsion. Hence less pain. Mean episodes of colicy pain (1.41 vs 0.43; $p<0.05$) was significantly higher in patients managed by tamsulosin. Mean episodes of colicky pain in patients with tamsulosin was in Puvvada et al was 0.45 in tadalafil group and 1.30 in tamsulosin group.[1] MET not only facilitates stone passage, but also decreases the colicky pain episodes and analgesic requirement. In the study by Bahadur et al, 48 of 85 patients on Tadalafil (56.47%) had no episodes of colicky pain and 52 of 85 patients (61.17%) did not require any analgesics for pain during the study period.[2] The number of episodes of colicky pain, the pain score, and the analgesic requirement were less in patients on Tadalafil as compared to tamsulosin.

Jayant et al, who had compared tamsulosin with the combination of tamsulosin and tadalafil, demonstrated a significantly decreased expulsion time (16.7±4.8 vs. 14.9±4.4 days, $p=0.003$), significantly fewer colicky pain episodes (1.60±1.0 vs. 0.45±0.68, $p=0.000$), and significantly less analgesic use (2.90±0.90 vs. 1.87±0.8, $p=0.000$).[5] Colicky pain in ureteral stones occurs owing to an increase in intraureteral pressure above the site of ureteral obstruction. Kinnman et al demonstrated that α-blockade relieves ureteric colic by blocking the C-fibers responsible for mediating pain.[12] Both drugs are thought to decrease the frequency and amplitude of phasic peristaltic contractions that accompany ureteric obstruction and to decrease the need for analgesia. In the present study, these parameters were lower in tadalafil group. Hasan et al reported a significantly lower pain score of 3.9 versus 7.9 ($p<0.01$) and a significantly lower analgesic requirement in the tadalafil group than in the placebo group.[11]

Mean episodes of colicky pain in patients with tamsulosin was more in study done by Puvvada et al which corresponds to the findings analysed in the present study suggesting that the tadalafil is better in controling pain too and so the no. of colicky episodes are less as well as the use of analgesic is also low.[6]

Hospital visits

The number of hospital visits required during treatment were also more with Tamsulosin, but the difference did not reach significance levels (2.56 vs 2.02 days; $p=0.06$).

Adverse reactions

The various side effects noted during the study period in patients on Tadalafil and tamsulosin group were headache (13.3% vs 10%), dizziness (13.3% vs 10%), backache (10% vs 13.3%), hypotensive episodes (6.7% vs 10%) and abnormal ejection (6.7% vs 13.3%). No difference was seen in the adverse effect profile of both drugs. In the study by Bahdur et al, the incidence of side effects were similar in both groups.[7] Similar results were demonstrated in studies by Kumar et al and Jayant et al.[9,10] No serious adverse effects were encountered in either group in our study and all reported side effects were mild and well tolerated.

CONCLUSION

In present study conclude that the patient with tadalafil had less symptomatic hospital visit as compared to

Tamsulosin because tadalafil had early expulsion of stone with lesser colicky pain episode. In recent years, medical expulsive therapy (MET) has been used in the management of distal ureteric stones as a supplement to conservative treatment. In present study, we compared efficacy of Tadalafil and Tamsulosin as MET for distal ureteric stones. Our results showed that tadalafil has a significantly higher ureteric stone expulsion rate. Tadalafil also provides early stone expulsion, a greater decrease in colicky pain episodes, and a greater decrease in analgesic requirement. Both drugs are safe, effective, and well tolerated with minor side effects. Thus, Tadalafil is safe, efficacious, and well tolerated as medical expulsive therapy for distal ureteric stones.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Parikh C, Gurjar V, Shah S. Tamsulosin versus tadalafil as medical expulsive therapy of distal ureteric stones: a comparative study. Int Surg J 2019;6:982-8.