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The efficacy and safety of alpha-1 adrenoceptor blocker (Alfuzosin) in improving symptoms and pain in patients with DJ ureteric stent

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ABSTRACT

Objective: *We conducted a randomized study to evaluate the effect of (Alfuzosin) in improving urinary symptoms and pain in patients with indwelling double-pigtail ureteral stent using specific questionnaire.*

Patient and Method: *We prospectively enrolled 60 patients (30 men and 30 women mean age 34.6 years) who underwent ureteral stent positioning and were assigned into one of two study groups. In group A(n=30) patients were discharged with a prescription for (Alfuzosin) 10 mg once daily. In group B(n=30), patients received no α1 blocker (control group).*

Results: *One week after stent placement (visit week 1[W1]), analyses of ureteral stent symptoms questionnaire showed a significant worsening of urinary symptoms (14.2 v 27.2 P=0.008) and pain (5.3 v 20.4 P=0.002) in patients not receiving (Alfuzosin). There was also a significant difference in the mean visual analogue score (VAS) of health scale between the two groups (P<0.001) compared with the results obtained at the(visit week 4 [W4]) evaluation. The proportion of patients developing acute attacks of pain and the numbers of diclofenac injections at week 1 varied between the two groups in a highly statistically significant manner (P<0.0001).*

Conclusions: *Our findings indicate that administration of (Alfuzosin) has a significant effect on stent-related urinary symptoms and pain for improving quality of life. Further clinical research in this field is needed to better define the role of α1-blockers in current clinical practice.*

Keywords: *alpha-1, adrenoceptor, blocker, Alfuzosin, DJ ureteric stent.*

I. INTRODUCTION

The double-J or pigtail stent is a catheter or tube placed within the ureteral lumen in a retrograde or antegrade fashion in order to maintain its patency [1], (its first description in 1967 by Zimskind,et al). The pigtail catheter provides a self-retaining capability due to a double coil design at proximal and distal ends that work to securely anchor the stent in the upper urinary tract (renal pelvis and upper calyx) and the bladder. This prevents stent migration proximally or distally despite urinary flow, patient movement, and ureteral peristalsis [2].

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Ureteral stents play a major role in a wide range of situations where urinary drainage is needed, urgent indications include cases of obstructive pyelonephritis and intolerable acute renal colic [3]; safety indications following endoscopic procedures include ureteral edema or perforation, steinstrasse, history of renal failure, and solitary or transplant kidney [4]. Relative indications would still include stone burden larger than 2 cm undergoing extracorporeal shockwave lithotripsy; pregnancy with long-standing impacted stone, recent history of urinary tract infection or sepsis; stent to passive dilate the ureter and/or ureteral orifice; prolonged endoscopic operative time (over 45 minutes) and any patient with imminent post-operative plans such as a second-look ureteroscopy [5].

The symptoms related to ureteral stents and their respective estimated incidence(as several studies in literature describes) : **Irritative voiding symptoms** including; *frequency* (50-60%), *urgency* (57-60%), *dysuria* (40%), *incomplete emptying* (76%), **pain**; flank (19-32%) and suprapubic (30%), **incontinence**, and **hematuria** (25%) are included [8,9].

Frequency is attributed to a mechanical stimulus that comes from the bladder coil. Along with urgency, it affects a significant proportion of patients (60%). Daytime frequency distinguished by the lack of coexisting nocturia suggests that mechanical stimulation relates to physical activities and/or awareness of this stimulation during the day, which would not be significant during the night [6]. Objective assessment through frequency volume charts corroborates this theory [6]. Recently, investigators confirmed that stent displacement with physical activity may impact stent discomfort [11]. In a small study of 6 patients, they noted up to 2.5 cm of movement of the renal coil or bladder coil and associated bowing in the proximal ureter with alteration in patient position [10].

Urgency is thought to be a direct result from the presence of the stent, which may also unmask or exacerbate pre-existing subclinical detrusor over activity [6].

Dysuria is usually experienced at the end of voiding. It has been proposed that dysuria is secondary to trigonal irritation by the distal end of the stent when it crosses the midline or forms an incomplete loop [8]. urgency and dysuria were more common with longer stents and negatively impacted the patients' quality of life [11].

Flank pain is most likely a result of urine reflux towards the kidney that leads to an excessive rise in intrapelvic pressure that ultimately translates into pain [12].

Suprapubic pain can result from local bladder irritation by the distal coil or as a secondary sign of associated complication such as encrustation or infection [14].

Hematuria may result from surgical management of existing disease and from the stent placement itself as well [13].

Incontinence typically occurs in association with episodes of urgency, the physiopathology of which was 'addressed above, or as a result of stent migration beyond the bladder neck into the proximal urethra by-passing the urethral sphincteric mechanism of continence [15].

Joshi *et al* reported on the first study to objectively evaluate the Symptomatology associated with stents. They prospectively assessed the prevalence and bother of various urinary tract symptoms caused by indwelling ureteral catheters using validated questionnaires (International Prostatic Symptoms Score – IPSS, International Continence Society male questionnaire, Quality of Life questionnaires, and the Bristol Female Lower Urinary Tract Symptoms questionnaire - BFLUTS). Although they succeeded in showing the association of urinary

symptoms with stents and their negative impact on patients' quality of life , the most important contribution was to bring to attention the need for the development of a stent-specific measuring tool [6].

In order to better orient clinical decision making and practice, they later developed and validated a questionnaire to specifically address this purpose . The Ureteral Stent Symptom Questionnaire (USSQ) consists of 38 items examining 6 sections: pain, voiding symptoms, work performance , sexual matters , overall general health , and additional problems[16]. It was shown that 76% of patients had urinary symptoms, 70% had pain severe enough to reduce their activities by 50% and felt less healthy in general, and 32% experienced sexual dysfunction [17].

Stent coating

Encrustation of the stent may lead to ipsilateral ureteral obstruction and renal colic, stents that are in situ for more than 12 weeks have a 76% incidence of encrustation [18]. The ureteral stent provides a surface for biofilm formation, bacterial colonization , and encrustation [18]. After biofilm formation, encased bacteria gain dormancy and resistance to eradication by antibiotic agents , therefore , research has been focusing on preventing this process [18].

In an attempt to incorporate drugs to the core of the polymeric structure of the stent material , a *Triclosan* loaded stent was developed (Boston Scientific Triumph TM) and was shown to decrease bacterial growth in artificially infected urine with Proteus mirabilis, probably by preventing bacterial adherence to the biofilm of the drug coated stent which in turn might lead to a decrease in stent encrustation [19].

Drug-eluting stents using the anticancer drug Paclitaxel was tested in a porcine model , with the hope of reducing the hyperplasic reaction of the urothelium , a mild inflammatory reaction without hindering luminal patency was noted[20,22-25].

Visual analogue scale

The visual analogue scale (VAS) consists of a line, usually 10 cm long, whose ends are labeled as the extremes of pain (e.g., no pain to unbearable pain) . A VAS may also have specific points along the line that are labeled with numbers or intensity-denoting adjectives. Such scales are called graphic-rating scales. Patients are asked to indicate which point along the line best represents their pain intensity. The distance from the no pain end to the mark made by the patient is that patient’s pain intensity score [26].

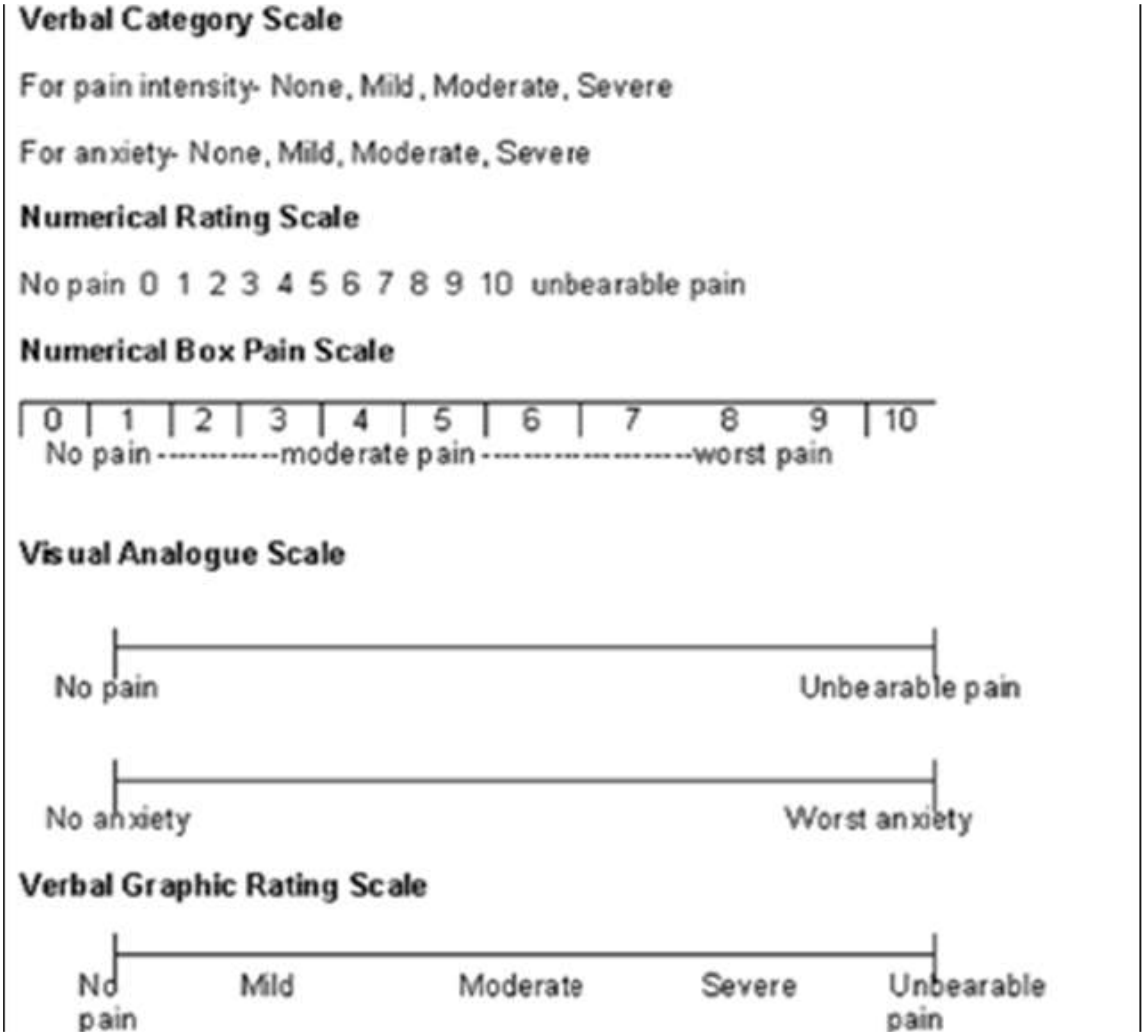

Fig.1 Different types of pain measurement maneuvers.

A VAS for pain effect has been developed in an effort to include domains of measurable pain experience other than the sensory intensity dimension. Endpoints are labeled “not bad at all” and “the most unpleasant feeling imaginable [26].

The VAS has the advantage of simplicity. It is widely used and is Independent of language. It is easily understood by most patients and can be readily reproduced on successive presentations. Children from age seven can understand it [26].

Numbers should not be placed on the VAS, since preferred numbers like 5 and 10 will attract an unfair share of the results. A plain line VAS (absolute or unmarked line) running from left to right is the most unbiased scale and is recommended [26]. Some patients may have difficulty understanding and using the VAS measures. There is a quoted failure rate of seven percent [26].

Responses to VAS are influenced by several various biases affecting psychophysical responses . It requires a certain amount of visual and motor coordination, which may be lacking in the postoperative period, and measurement may be difficult to perform after anesthesia, when patients may have difficulty concentrating [16].

Alfuzosin [33]

A- PHARMACEUTICAL INFORMATION

Drug Substance

Proper Name: Alfuzosin hydrochloride

Chemical Name: (R,S)-N-[3-[(4-amino-6,7-dimethoxy-2- quinazolinyl) methylamino] propyl] tetrahydro-2-furancarboxamide hydrochloride

Molecular formula and molecular mass: C19H27N5O4•HCl; 425.92

B- ACTION AND CLINICAL PHARMACOLOGY

Mechanism of Action:

Is a uroselective antagonist of post-synaptic α1- adrenoceptors located in the prostate, bladder base, bladder neck, prostatic capsule, and prostatic urethra.

PHARMACODYNAMICS:

Alfuzosin , blocks α1-adrenoceptors leading to a relaxation of the smooth muscle in the bladder neck and prostate.

In human tissue, *in vitro*, alfuzosin has induced preferential α1-adrenoceptor antagonist activity on prostatic cells relative to renal artery cells.

This is illustrated in the figure below:

Alfuzosin has a balanced binding affinity for the three α1-adrenoceptor subtypes either in animal tissues (native: α1A, α1B) or cloned from human tissues and expressed in isolated cells (α1a, α1b, α1d).

Alfuzosin has a selective binding profile in favor of α1-adrenoceptors with little or no affinity for D2-dopaminergic, 5HT1 and 5HT2-serotoninergic, H1-histaminergic, β-adrenergic or muscarinic cholinergic receptors.

Alfuzosin is a potent competitive antagonist of contractions induced by α1-adrenoceptor stimulation by phenylephrine in trigone and urethra from male rabbits. In the anaesthetized cat, by the intravenous (i.v.) route of administration, ***Alfuzosin*** potently inhibited urethral hypertonia induced by electrical stimulation of the hypogastric nerve.

Pharmacokinetic:

Bioavailability is reduced when ***Alfuzosin*** is administered under fasting conditions. Aconsistent pharmacokinetic profile is obtained when ***Alfuzosin*** is administered following a meal.

A mean peak plasma concentration of 12.3 ± 6.6 ng/mL is reached in 6 to 14 hours after a single dose. A plateau of concentration is observed from 3 to 14 hours with concentrations above 8.1 ng/mL (Cav) for 11 hours.

Distribution:

Alfuzosin is moderately bound to plasma proteins with the free fraction accounting for 13.3% in healthy volunteers. Salicylic acid, hydrochlorothiazide, diltiazem, digoxin and indomethacin does not affect the binding of

Alfuzosin to human plasma proteins. Based on *in vivo* data, it is not likely that ***Alfuzosin*** will affect the extent of binding of these drugs to human plasma proteins. There is an increase in free fraction in renal insufficiency patients (16.8%) and in patients with hepatic disease (20.8%).

Metabolism:

Alfuzosin undergoes metabolism by the liver, with only 11% of the parent compound being excreted as unchanged in the urine. The metabolites which are all inactive are eliminated in the urine (15-30%) and feces (75-91%).

Excretion:

Following intravenous or oral administration, the elimination of ***Alfuzosin*** is characterized, in healthy young subjects and in the target population, by a terminal half-life of about 4.8 hours and a total clearance of 0.3 L/h/kg.

The apparent half-life of ***Alfuzosin*** is increased to 9.1 hours in healthy middle-aged volunteers and to 10.1 hours in elderly volunteers.

C- Special Populations and Conditions

Renal Insufficiency*:*

Compared to subjects with normal renal function, the mean Cmax values of ***Alfuzosin*** are moderately increased (1.5 to 1.6 fold) in patients with various stages of renal impairment,

Hepatic Insufficiency:

After a single oral administration of ***Afuzosin*** in patients with severe hepatic insufficiency, the elimination half-life is prolonged.

Chronic Cardiac Insufficiency*:*

No affect by chronic cardiac insufficiency.

D- INDICATIONS AND CLINICAL USE

Alfuzosin hydrochloride is indicated for:

** Benign Prostatic Hyperplasia*:

Alfuzosin is indicated for the treatment of the signs and symptoms of benign prostatic hyperplasia (BPH).

** Acute Urinary Retention*:

Alfuzosin is indicated as adjunctive therapy with urethral catheterization for Acute Urinary Retention related to BPH and management following catheter removal.

E- CONTRAINDICATIONS

Alfuzosin is contraindicated in:

• Patients with a known hypersensitivity to ***Alfuzosin*** or to any ingredient in the formulation.

• Patients with moderate to severe hepatic insufficiency, since ***Alfuzosin*** blood levels are increased in these patients.

• Combination with other alpha1-blockers.

• Combination with potent CYP3A4 inhibitors such as ketoconazole, ritonavir

F- Adverse Drug Reactions

The following adverse events have also been reported in post marketing experience: The following frequency rating is used;

very common (≥ 10%), Common (≥ 1% and < 10%), Uncommon (≥ 0.1% and < 1%), Rare (≥ 0.01% and < 0.1%), Very rare (<0.01%)

Cardiac Disorders:

Uncommon: tachycardia

Vascular Disorders:

Uncommon: flushing

Gastrointestinal disorders:

Uncommon: diarrhea

General Disorders and Administration Site Conditions:

Uncommon: edema, chest pain

Ear and Labyrinth Disorders:

Uncommon: vertigo

Eye disorders:

Cases of intraoperative floppy iris syndrome have been reported

Hepato-biliary disorders:

Cases of hepatocellular injury and cholestatic liver disease have been reported.

Reproductive System Disorders:

Cases of priapism have been reported.

Skin and Subcutaneous Tissue Disorders:

Uncommon: rash, pruritus

G- DRUG INTERACTIONS

Drug-Drug Interactions:

Anti-Infectious Drugs:

Imidazole(Ketoconazole):

Cardiovascular Drugs

Alpha1-Blocker:

Anticoagulant(Warfarin):

Beta-Blocker(Atenolol):

Calcium Channel Blocker(Diltiazem):

Cardiotonic Glycoside(Digoxin):

Diuretic(Hydrochlorothiazide):

Nitrates:

Sexual Function Drugs:

Inhibitor of phosphodiesterase type 5 (PDE5):

Because of the vasodilatory effects of alpha-blockers and PDE5-inhibitors, patients treated with alpha-blocker therapy should be hemodynamically stable before treatment with PDE5- inhibitors is initiated.

Drug-Food Interactions:

Alfuzosin should be taken after a meal.

H- DOSAGE AND ADMINISTRATION

Recommended Dose and Dosage Adjustment:

Benign Prostatic Hyperplasia: The recommended dosage is one 10 mg ***Alfuzosin*** tablet daily to be taken after the same meal each day.

Acute Urinary Retention: The recommended dosage is one 10 mg ***Alfazosin*** tablet daily after a meal to be taken from the first day of catheterization and continued beyond catheter removal unless there is a relapse of acute urinary retention or disease progression.

II. AIM OF THE STUDY

The aim of this present study is to recognize the efficacy and safety of alpha-1 adrenoceptor blocker (***Alfuzosin***) in improving symptoms (mainly pain) in patients with D.J. ureteric stent.

III. PATIENTS & METHODS

From May 2012 to May2013, 60 patients were included and followed up in the urologic consultation department in Hussein Teaching Hospital in Dhi Qar (from any cause) with pyeloureteral colic , (30 men and 30 women , mean age 34.6 years) all of them had subsequent ureteral stenting with 5Fr. polyurethane stent 25cm length.

The study exclusion criteria were:

* LUTS related to benign prostatic hyperplasia (International Prostate Symptom Score higher than 8).

* a history of stent placement.

* chronic prostatitis.

* medication with alpha blocker or analgesics.

* positive urinalysis for infection.

All patients were informed about study design before participating and assignment into one of the study groups was achieved using randomization tables.

In group A (n=30) patients were discharged with (*Alfuzosin*) 10 mg once daily. In group B (n=30) patients received no (*Alfuzosin*) (control group). Patients were aware of whether they were taken (*Alfuzosin*) or not. All patients received a prescription of ciprofloxacin twice daily for 5 days and analgesics on demand.

Patients returned 1 week later (W1) for their first evaluation. The correct placement of the stent or dislodgement as a cause of stent related symptoms was verified with plain radiography of kidney, ureter and bladder and ultrasonography, in addition urine sample was taken to examine for infection. Stent removal was planned for the following week (W2) (when it indicated)while group A were still receiving (*Alfuzosin*). At the time of stent removal, urine samples were assessed for infection.

Questionnaires were administered at W1,W2 and W3 while patients on group A still receiving (*Alfuzosin*) and finally one week after withdrawal from medical therapy (W4). They include questions for urinary symptoms (dysuria, hematuria, urgency and frequency) as represented by ureteric stent symptoms questionnaire (USSQ) which contained questions regarding general health status like pain (site and duration), pain on micturition, fever, need for medications, and need for analgesics. The answers are based on a three-point rating scale and high score indicates worse outcomes.

In the VAS, we asked patients to express their perception of the intensity of the pain. Patients were requested to define the colicky pain they experienced as a number between 0 and 10 by comparing the pain with the most severe pain they had ever experienced (0, no pain; 10, the most severe pain perceived).

Positive effects on the reduction of stent-related urinary symptoms and impairment of quality of life were the primary end points of the study. A difference of more than 30% was considered a meaningful difference.

(*Alfuzosin*) was defined as responsible for the reduction of stent-related urinary symptoms and quality of life impairment if its use decreased the expected VAS. To detect a difference of this magnitude with a power of 80% and a significance level 5%, about 24 patients per arm ((*Alfuzosin*) versus no medication group) were required.

All variables were expressed as mean values ± SD or as numbers of patients and percentages .Statistical analyses were performed with Student's T test. A P-value of less than 0.05 was considered significant. Analyses were performed using SPSS software, version13.0 for Windows (SPSS, Chicago, Illinois, USA).

IV. RESULTS

All 60 patients (30 women and 30 men) completed the study. Mean age at presentation was 34.6 years (range 25-58 years). No stent required manipulation before removal.

The analysis of the questionnaire at W1 showed a significant difference in the main percentage of symptoms in the three domains (urinary symptoms, other than pain; pain; additional problems,UTI,need for pain killer) between group A and B.

Table 1: Data at week 1 visit for the stent related symptoms questionnaire.

		Group A(30 pat.) / Group B(30 pat.)			
		Never	Occasionally	Frequently	Always
Urinary Symptoms	Dysuria	24/5	4/9	2/6	0/2
	Haematuria	5/5	7/6	6/4	3/2
	Urgency	6/7	4/5	4/10	1/2
	Frequency	1-4 Times 8/3	5-7 Times 4/9	8-12 Times 2/7	> 12 Times 1/7
Pain	Flank	24/20	3/6	2/1	1/3
	Bladder	25/16	2/7	2/4	1/3
	Both	22/18	1/7	1/3	0/2
Additional problems	UTI	28/18	1/7	1/3	0/2
	Need for Pain killers	17/5	8/14	3/4	2/3

In the analysis of different time periods, when comparing the W4 evaluation with that of W1 after stent positioning, the proportion of patients in group B who reported urinary symptoms and pain varied significantly (14.5 *v* 27.2 *P*=0.008 and 4.5 *v* 20.4 *P*=0.002) in the mean time, patients in group A showed no significant worsening of urinary symptoms and pain (Fig. 2) and (Fig. 3).

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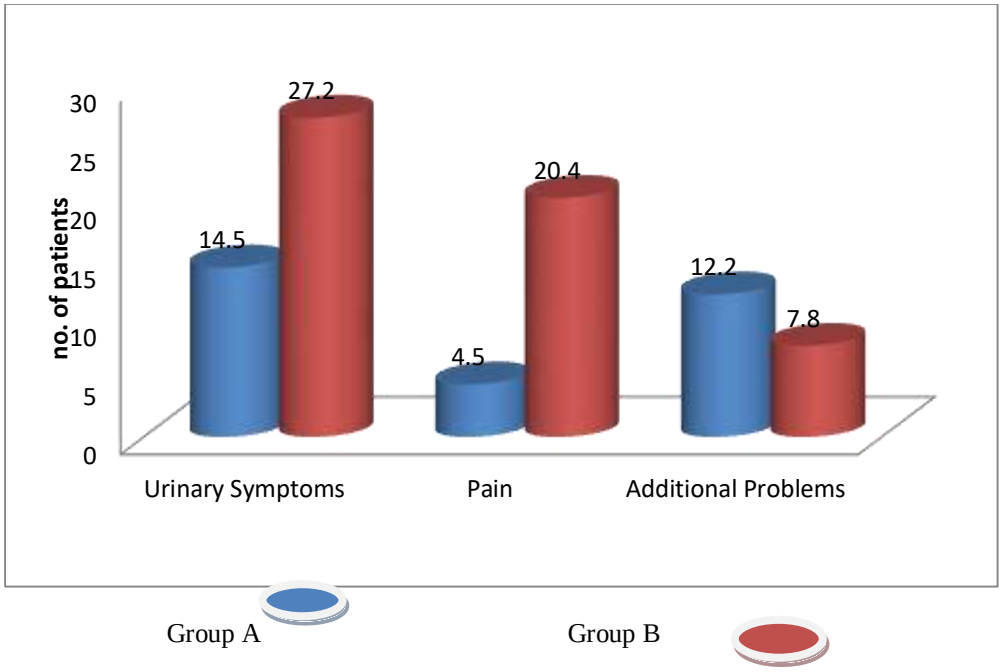

Fig.2: Ureteric Stent Symptoms Questionnaire Index Scores in Group A(***Alfuzosin***) and Group B (Control) at Week 1.

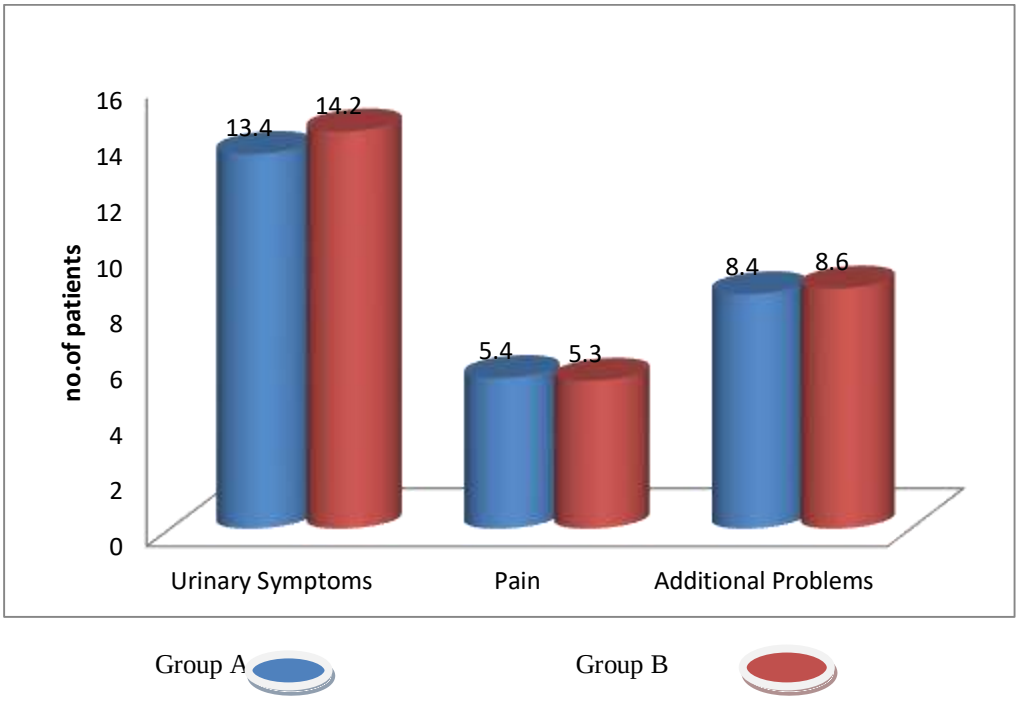

Fig. 3: Ureteric Stent Symptoms Questionnaire Index Scores in Group A (***Alfuzosin***) and Group B (Control) at Week 4.

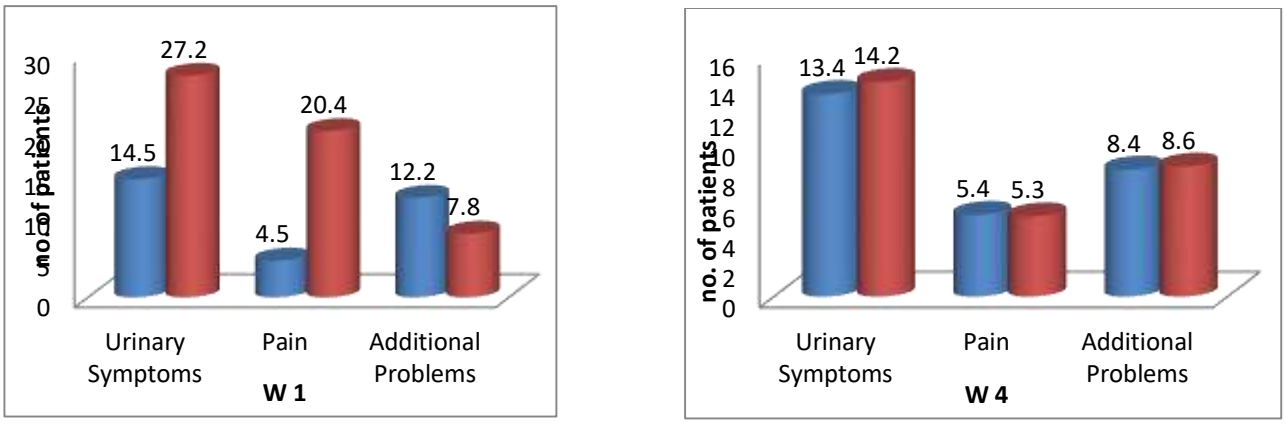

Fig. 4: Ureteric Stent Symptoms Questionnaire Index Scores in Group A (*Alfuzosin*) and Group B (Control) at Week 1 and Week 4.

At W1, pain occurred in the flank region in 6 patients of group A and 10 patients of group B; pain was reported in the bladder region in 5 patients of group A and 14 patients of group B (table 1).

Overall stent related ***pain*** was reported at one site (i.e., flank or bladder region) by 14 of 30 (45.9%) patients and 24 of 30 (80.5%) patients in group A and B respectively (p=0.02) (table 1). ***Dysuria*** was reported at W1 in 6 patients in group A and in 23 patients in group B. ***Hematuria*** reported in 21 patients in group A and 17 patients in group B. ***Urgency*** was reported in 14 patients in group A and 24 patients in group B. ***Frequency*** was reported in 15 patients in group A and 26 patients in group B. ***UTI*** had occurred in 2 patients in group A and 12 patients in group B. A ***need for pain killers*** was reported in 13 patients in group A and 26 patients in group B (table 1).

The mean attack of acute colic was 3 +\- 1.2(range 1-5) in group B and 1.5 +\- 1 (range 0-3) in group A patients and this result was with highly significant difference (P<0.0001). The mean number of Diclofenac injections during therapy was 5.2 +\- 2 (range 3-9) for group B and 0.8 +\- 1 (range 0-3) for group A showing the significantly less analgesic injection use in group A (P<0.0001). No difference in median analgesic injection use was observed between males and females. (table 2).

Table 2: The difference of parameters between the two groups.

Parameters	Group A (n=30)	Group B (n=30)	P value
Mean No. of acute colic attacks (range)	1	3	

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	.5 (0-3)	(1-5)	< 0.0001
Mean No. of Diclofenac inj. (range)	0 .8 (0-3)	5.2 (3-9)	< 0.0001
P value <0.05 considered significant.			

Fig.(5) showing the mean value of visual analogue score scale(VAS) for group A (***Alfuzosin***) and group B (control). Mean value for VAS was (3.1 *v* 6.5) for W1, (3 *v* 3) for W3 and (2.8 *v* 2.6) for W4 for group A and B respectively. Comparing with the results obtained at W4, at W1 (1 week after stent positioning) there was a significant difference in mean value of VAS score between 2 groups (*P*<0.001). Moreover, 1week after stent removal at W3, there was no significant difference in the mean value of VAS score between ***Alfuzosin*** and control patients (*P*=0.08) (Fig. 3).

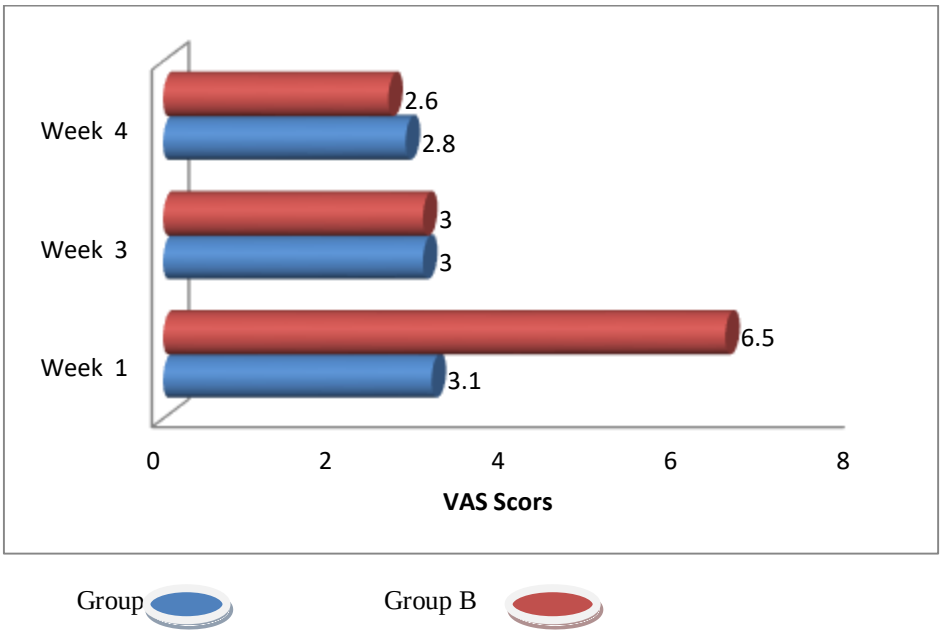

Fig. 5: Mean value of visual analogue score scale for group A(*Alfuzosin*) and group B (control).

V. DISCUSSION

Since its first description in 1967 by Zimskind, et al. the double J ureteral stent has been indispensible tool in the urologists surgical armamentarium,Ureteral stents play a major role in a wide range of situations where urinary drainage is needed [1]. Despite the limited indications of double J stent placement, they are thought to be overused in a contemporary urology practice [3].

In a recently published survey among community and academic practicing urologists from worldwide centers, Auge et al. reported that 98% of the responders perform ureteroscopic stone surgery in their routine. Of these, two-thirds would place a stent more than 50% of the time and 13% would always place a post- operative stent, even

though intolerance to the stent presence was the most significant problem addressed by patients (98%) [28]. Based on a recent meta analyses, the role of stenting in uncomplicated ureteroscopy remains unclear, even though stent placement results in a considerable morbidity in the form of irritative LUTS [29]. Therefore, patients should be involved in the decision to use or not, once they are made aware of the possibility of a secondary unplanned procedure for repositioning [30].

During the last decade, technical advances in stent development and design (e.g., tapered distal ends) and construction (e.g., magnetic, biodegradable and tissue engineered materials) to decreased stent related morbidity. The ideal biomaterial has yet to be discovered. Recently, Joshi and coworkers found no difference in the impact on patient's quality of life between ureteral stents of different compositions. The USSQ, first developed by Joshi and colleagues, has shown satisfactory validity with good evaluative and discriminative properties it showed incontinence , and haematuria in 78% of patients and stent related pain in 80% of patients [6]. Our results are in accordance with their findings. At W1 following stent insertion about70% of the control patients reported stent related pain in the loin or bladder region.

According to our results, the use of ***Alfuzosin*** significantly reduced stent related urinary symptoms(70%) and pain(80%) therefore improving quality of life ,which is because ***Alfuzosin*** acts as a competitive antagonist of alpha-1 adrenoceptor-mediated contraction of prostatic, bladder and proximal urethral smooth muscle, it can reduce urethral pressure and resistance, bladder outlet resistance, bladder hyperactivity and lower urinary tract symptoms [31].

In the evaluation of general health, analyses of questionnaires reveals an association between ***Alfuzosin*** use and responses regarding the different domains particularly pain-discomfort being the most bothering of all domains. Our results was found to be superior to what was found by Beiko and colleagues who proposed a novel approach by relieving LUTS by using intravesical administration of various agents (oxybutynin, alkalinized lidocaine, or ketorolac). Ketorolac appeared to be the most safe and effective intravesical agent in reducing stent related discomfort [32].

We observed that patients who were given ***Alfuzosin*** had significantly better outcome in that they had less VAS (Visual Analogue Scale) scores, less attacks of acute colic, and they used less NSAIDs injection during therapy ($P<0.0001$, $P<0.0001$, and $P<0.0001$ respectively). These findings made obvious that the effect of ***Alfuzosin*** on the ureter was probably to decrease the frequency and amplitude of phasic peristaltic contractions that accompanying ureteric manipulation [32].

Additional problems (e.g. Symptoms of urinary tract infection) were reduced in ***Alfuzosin*** group at W1, with no significant statistically differences between men and women. Symptoms of overactive bladder and concomitant detrusor hyperactivity have been treated with alpha-1 blockers because of their effects on bladder smooth muscle [33]. Through their action on unmyelinated C- fibers of the urethral afferent mechanism.

VI. CONCLUSION

From this study we can conclude that:

1. The administration of selective alpha-one blocker , such as ***Alfuzosin*** has a positive effect on stent-related urinary symptoms and

quality of life.

2. Treatment with ***Alfuzosin*** affords an outstanding control of pain for patients with double J ureteric stent.

VII. RECOMMENDATIONS

To Health Professionals:

*To recommend treatment with **Alfuzosin** 10 mg daily for stent related lower urinary tract symptoms and pain.*

To Researchers:

*To conduct further studies with larger numbers of patients for the evaluation of the proposed role of **Alfuzosin** in the treatment of LUTS and pain following DJ insertion.*

*To conduct more studies for the role of other α1-adrenoceptors blockers – like Silodosin for example–in comparison for **Alfuzosin** for the same course of treatment.*

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