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ORIGINAL ARTICLE

Comparison of pain scores between first and second session ESWL treatment for kidney stone patients.

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ABSTRACT… Objective: To determine and compare pain scores between the first and second session ESWL treatment for kidney stone patients. **Study Design:** Descriptive, Case Series. **Setting:** Armed Forces Institute of Urology, Rawalpindi. **Period:** 1st January 2021 to 30th June 2021. **Methods:** A total of 133 patients with renal pelvis stone of 8-20 mm, 15 to 65 years old of the two sexual orientations were incorporated. Patients with stone in calycealdiverticulae with limited infundibulum, Renal ectopia or contortion, pregnancy, pyonephrosis and PUJO, claustrophobic and cardiovascular speed producer were prohibited. In the wake of taking informed assent, extracorporeal shock wave lithotripsy (ESWL) was finished in every patient. After this, anti-infection (infusion ceftriaxone 1gm IV x detail) and pain relieving (infusion dyclo IM x detail) was given to all patients before every meeting. Then extracorporeal shock wave lithotripsy (ESWL) was finished in every patient by single specialist (something like 3 years of post-cooperation experience). In all patients, two meetings were finished and torment score after first and second meeting (in no less than 10 days) was noted. **Results:** Age range in this study was from 15 to 65 years with mean time of 41.17 ± 8.83 years. Larger part of the patients 76 (57.14%) were between 15 to 40 years old. Out of 133 patients, 84 (63.16%) were male and 49 (36.84%) were females with male to female proportion 1.6:1. In our review, mean agony score after first meeting of ESWL was 5.29 ± 0.79 and after second meeting of ESWL was 3.75 ± 0.89 with p-worth of 0.0001. **Conclusion:** This study concluded that VAS scores is significantly lower in the second session of ESWL.

Key words: Extracorporeal Shock Wave Lithotripsy, Pain, Renal Stone.

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INTRODUCTION

Kidney stones represent a huge burden of disease on the planet. Beginning in 1976, the incidence of kidney stones increased markedly, a change likely driven by the weight epidemic[1]. Up to half of people with stones will develop stones again within 5 years which interspersed with intermittent forms that indicate the invasion of kidney stones. The main goal of kidney stone treatment is to maximize stone clearance without causing pain to the patient.[2] To achieve this, different non-obvious invasive modalities have been described, such as shock wave lithotripsy (ESWL), percutaneous nephrolithotomy (PCNL) and retrograde intrarenal surgery (RIRS).[3] The preferred method is SWL and for stones <2 cm is PCNL, but the treatment of stones 1 to 2 cm remains questionable.[4] This situation has been further exacerbated by the expansion of RIRS into the arsenal over the past two decades.[5]

Extracorporeal shock wave lithotripsy (ESWL) has long been used to treat kidney stones. Special rules mention ESWL as a reliable alternative treatment to ureteroscopy (URS) for the detection of upper ureteral stones less than 10 mm. favored. Disappointment in ESWL can lead to futile opening of the renal parenchyma, resulting in corona waves and difficulty, thus requiring permanent elective treatment, resulting in additional clinical costs.[6-7]

After ESWL, the system was performed under extensive sedation. Specialized modifications of the lithotripter allow the treatment to be performed without the use of general sedation, although lower levels of force are often used. Despite this, ESWL is still generally considered a distressing system. This can be caused by shock waves reaching superficial (skin and muscles) and deeper (ribs, nerves, and kidney capsules) structures. and unnecessary suffering.

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An elevated perception of pain may also limit potential opportunities to exert sufficient energy types of SWL devices, etc.).[8-9]

There is no information or close research on this topic. Due to the great pain during ESWL, the managers reduced the patient's nervousness and gave him great consistency and urged him to continue performing the method. Therefore, the current review aims to create close information and provide technical support to patients.

METHODS

In the wake of getting endorsement from institutional survey board (Uro-adm-Trg-1/IRB/2020/109) an observational review was directed at Military Foundation of Urology (AFIU), Rawalpindi where 133 patients going through extracorporeal shock wave lithotripsy (ESWL) were evaluated tentatively for torment appraisal from 1st January 2021 to 30th June 2021. The determined example size was 133 with 95% certainty level, 5% outright accuracy required and taking mean agony score after second meeting of ESWL as 5.23±2.94.11The testing method was non-likelihood, successive inspecting.

Measurements considered for the review included patients ranging in age from 15 to 65 years in one direction or the other, a single stone in the renal pelvis > 1 month of age based on the functional significance of the term, and a stone size of 8 to 20 mm.

Review prohibitions: Pregnancy (assessed by ultrasound), muscular or spinal torsion (preventing legal position), calyceal diverticular stones with elongated infundibulum, ectopia or renal malformation (horseshoe kidney or pelvic kidney), patients with PUJO (under examination in CTU), patients with pyonephrosis and sepsis (after clinical evaluation), patients with claustrophobia, patients with cardiovascular pacemakers, patients with intellectual disabilities and patients with elimination of calculations after the first visit.

Informed and dispassionate consent was obtained from each patient. Subsequently, antitoxin (ceftriaxone 1 g IV infusion x details) and analgesia (dyclo IM infusion x details) were administered to all patients before each meeting. Then, at this time, each patient's extracorporeal shock wave lithotripsy (ESWL) was performed by a single expert (approximately 3 years of post-collaboration experience). All patients completed two sessions and pain scores were recorded according to functional definitions after the first and second sessions (not less than 10 days). All information (age, orientation, stone length, stone size, BMI, diabetes, hypertension, place of residence, and VAS score at the first and second ESWL sessions) was recorded on a specially planned form.

Measurable verification was performed using SPSS Table 25.0. The mean and standard deviation of age, stone duration, stone size, BMI, ESWL length, and VAS score were determined in the first and second ESWL sessions. Determination of recurrence and relapse rate included counseling, diabetes mellitus (yes/no), hypertension (yes/no), place of residence (rural/metropolitan), history of renal medical surgery (yes/no), and affected side (right/left) Torment scores were observed across the range of the first and second ESWL sessions by applying free basic t-tests and paired t-tests, with p values ≤0.05 considered critical.

Impact modifiers like age, orientation, diabetes mellitus (yes/no), hypertension (yes/no), spot of living (country/metropolitan), past history of renal medical procedure (yes/no) and side impacted (right/left), length of stone, stone size and BMI. Post-delineation matched 't' test was applied to see their impact on VAS score and p-esteem ≤ 0.05 was viewed as critical.

RESULTS

Age range in this study was from 15 to 65 years with mean period of 41.17 ± 8.83 years. Greater part of the patients 76 (57.14%) were between 15 to 40 years old. Out of 133 patients, 84 (63.16%) were male and 49 (36.84%) were females with male to female proportion 1.6:1. Mean span of sickness in our review was 5.65 ± 2.28 months. Mean size of stone in our review was 14.11 ± 1.91 mm. Mean BMI was 27.40 ± 2.92 kg/m2. Appropriation of patients with status of other puzzling factors is displayed in Table-I. Correlation of agony scores between the first and second meeting ESWL treatment for

kidney stone patients is displayed in Table-II.

In our review, mean torment score after first meeting of ESWL was 5.29 ± 0.79 and after second meeting of ESWL was 3.75 ± 0.89 with p-worth of 0.0001.

Delineation of agony score concerning age, orientation, diabetes mellitus, hypertension, spot of living, past history of renal medical procedure and side impacted, span of stone, stone size and BMI is displayed in Table-III.

TABLE-I

Distribution of patients with status of other confounding variables (n=133)

Confounding Variables		Frequency	%age
Diabetes Mellitus	Yes	40	30.08
	No	93	69.92
Hypertension	Yes	32	24.06
	No	101	75.94
Place of living	Rural	54	40.60
	Urban	79	59.40
Previous history of renal surgery	Yes	36	27.08
	No	97	72.92
Side affected	Right	81	60.90
	Left	52	39.10

TABLE-II

Comparison of pain scores between the first and second session ESWL treatment for kidney stone patients.

	1st Session	2nd Session	P-Value
	Mean ± SD	Mean ± SD	
Pain score (VAS)	5.29 ± 0.79	3.75 ± 0.89	0.0001

DISCUSSION

After Schmiedt and Chaussy12 performed detailed shock wave lithotripsy (ESWL) for kidney stones in 1980, ESWL improved and was recognized as the first-line treatment option for small urinary tract stones.[10-12] The European Urology Rules recommend that ESWL is the best option for stones located in the kidney that measure <1 cm.[13] Unlike adaptive ureteroscopy and percutaneous nephrolithotomy, ESWL can be performed in short-stay facilities and the patient does not require systemic sedation.[14-16] Still, regardless of the benefits of SWL, the results of shockwave therapy can still be painful for patients, which may be one of the reasons why some patients consider whether to opt for SWL.[17-18] Additionally, thoughts of torture during SWL may cause the patient to change positions, which may alter the therapeutic shock wave center and therefore negatively affect SWL achievement rates.[19-21]

As SWL technology has advanced, the analgesic needs necessary to control pain during SWL have been significantly reduced.[22] Several clinical factors, such as sex, age, weight profile (BMI), and stone area, have been interpreted as predictive variables of ESWL-related pain. Encounter of ESWL in patients with kidney stones.[23-25]

The age range in this study was 15 to 65 years, with a mean duration of 41.17 ± 8.83 years. Most of the patients 76 (57.14%) were between 15 and 40 years old. Among the 133 patients, 84 were men (63.16%) and 49 were women (36.84%), with a male:female ratio of 1.6:1. 5.29 ± 0.79. The ESWL is 3.75 ± 0.89 and the p-value is 0.0001. In one review, VAS scores were significantly lower in the second ESWL session (5.23 ± 2.94 vs. 6.41 ± 2.37).[26-27]

Several studies have examined the association of different elements during SWL treatment with torture discrimination. Tokgoz et al 20 suggested that men may be more willing to endure the ordeal during SWL than women, and that the initial SWL session is often more pleasant for patients than the final session.[28] Gracious et al 21 also reported that emotional distress scores were affected by persistent age, sex, and stone area, but not by stone size or laterality.[29]

The ordeal during ESWL depends on the type of fuel source and how much energy is used. The need for painlessness is greater in women, younger patients, or patients applying higher voltages. And feel more pleasant afterwards. ESWL should be started at a lower voltage and increased slowly as treatment progresses. This gives the patient the opportunity to adapt to the treatment.[30]

The pathogenesis of discomfort in ESWL remains poorly understood, but is believed to be multifactorial.

TABLE-III

Stratification of pain score with respect to age, gender, diabetes mellitus, hypertension, place of living, previous history of renal surgery and side affected, duration of stone, stone size and BMI.

Co-morbid Conditions		1st session		2nd session		P-Value
		VAS score		VAS score		
		Mean	SD	Mean	SD	
Age (years)	15-40	5.39	0.75	3.70	0.89	0.0001
	41-65	5.14	0.83	3.82	0.89	0.0001
Gender	Male	5.26	0.75	3.79	0.89	0.0001
	Female	5.33	0.88	3.69	0.89	0.0001
Duration (months)	2-6	5.32	0.84	3.91	0.86	0.0001
	>6	5.20	0.69	3.38	0.87	0.0001
Size of stone (mm)	8-15	5.27	0.77	3.70	0.91	0.0001
	16-20	5.34	0.87	3.91	0.82	0.0001
BMI (kg/m^2)	≤27	5.16	0.77	3.79	0.91	0.0001
	>27	5.41	0.81	3.71	0.88	0.0001
Place of living	Rural	5.22	1.06	3.87	0.55	0.0001
	Urban	5.33	0.55	3.67	1.06	0.0001
Hypertension	Yes	5.50	0.67	3.78	0.94	0.0001
	No	5.22	0.82	3.74	0.88	0.0001
Diabetes mellitus	Yes	4.83	0.55	3.40	0.98	0.0001
	No	5.48	0.80	3.90	0.81	0.0001
Previous history of renal surgery	Yes	5.14	0.90	3.67	0.72	0.0001
	No	5.34	0.75	3.78	0.95	0.0001
Side affected	Right	5.02	0.81	3.64	0.90	0.0001
	Left	5.69	0.58	3.92	0.86	0.0001

Superficial cutaneous nociceptors and instinctive nociceptors, such as the periosteum, pleura, peritoneum, and external muscular nociceptors, are two important components responsible for pain during ESWL.[26] The size and location of the weight, the area of the front of the shock wave, the cavitation shock, the stress at the top of the shock wave, the size of the central area and the area of the shock wave at the skin also tends to cause pain. In the case of using shock waves to obtain large discontinuities in stones.[27]

Continued improvements have made ESWL more feasible in negligible darkness, allowing short-term ESWL to be performed without the need for general or spinal anesthesia. A CRITICAL QUESTION 28 Analgesics commonly used during ESWL include narcotics, narcotic hypnotics, nonsteroidal analgesics (NSAIDs), and local sedative ointments (e.g., EMLA). Associated with severe difficulties dyspnea, bradycardia, hypotension, nausea, regurgitation and delayed recovery time. Therefore, it is essential to choose a suitable method to relieve pain with fewer side effects. Although there are different examination reports analyzing changes in pain relief strategies during ESWL.[31]

CONCLUSION

This study reasoned that VAS scores is essentially lower in the second meeting of ESWL. Thus, we suggest that extracorporeal shock wave lithotripsy (ESWL) ought to be the essential methodology of decision in each patientwith renal stone of <2 cm and agony the board during ESWL ought to be engaged for getting the improved outcomes.

Ethical Approval

Ethical approval of this study was obtained

from Armed Forces Institute of Urology (AFIU), Rawalpindi.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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1	**Hafeez Ullah:** Acquisition, analysis.
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4	**Usman Javed:** Final approval.
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