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Research Article

ACUTE KIDNEY INJURY IN PATIENTS WITH STONES IN URETER

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Abstract:

Objective: The objective of this research work is to find out the frequency of Acute Kidney Injury, its danger aspects and its consequences among the patients of US (ureteric stone).

Methodology: This is an observational retrospective study conducted in Institute of Kidney Diseases Hayatabad Medical Complex Peshawar, and the duration of the study is from February 2018 to December 2018. One hundred and fifty-two patients underwent convenient sampling and their decompression operation carried out with the help of LASER, ureterorenoscopy & DJ Stenting for the stones in the ureter. The clearance of creatinine calculation carried out with the help of serum creatinine with the utilization of the Cock-Craft Gault Formula. This procedure was in use for every patient at the start and after the end of the treatment. SPSS V.17 was in use for the analysis of the collected information.

Results: Out of total one hundred and fifty-two patients who faced surgical methods of decompression for the stones of ureter, acute kidney injury was present in 32.20% (n: 49) patients. Patients suffering from acute kidney injury were of old age, enhanced height, bilateral stones, and stones in the lower part of ureter & with co-indispositions as compared to the patients without AKI. The patients evolving acute kidney injury, 89.70 got recovery either incompletely (20.40%) or fully (69.30%).

Conclusion: Acute kidney injury was in excess in the patients having stones in ureter with high age, enhanced height, bilateral stones, and stones in the lower area of ureter and found with co-morbidities. We found a good recovery rate after the removal of the obstruction.

KEYWORDS: AKI, acute, US, ureter, stones, methodology, recovery, bilateral, kidney, Gault formula. Utilization.

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INTRODUCTION:

A well acknowledged entity for hundreds of years is urolithiasis. Archeologist discovered the therapy of kidney stones in medical books of old Egypt [1-3]. The factors including social and economic condition, eating habits, race and living areas are responsible for the development of urinary stones [4]. Victoriano [5] reported a high occurrence of this disease in the whole world [5]. According to this report, men were more victims of this disease as compared to females in Iran & USA & most affected age group was from 40 to 49 years. Twelve percent men & 6.0% women will suffer colic of ureter once in whole time according to one report. Stones greater or equal to 4.0 mm & low and middle stones of ureter found with the great prospect of spontaneous passage [6]. Starchy foods as corn are common cause of stones with enhancing fatness as well as great consumption of fructose [7, 8]. Low liquid & low use of calcium have a link with the stones [9], so is the more utilization of proteins, Sodium & oxalate enhances the danger of stone forming [10, 11].

The change in the climate as global warming is also one of the causes of increasing stones [12]. The occurrence of the diseases of stones changes from 1 to 20% [13]. The occurrence of acute kidney injury in the patients with US concluded as 0.720% in one case work [14]. About 9.70% patients got development of acute kidney failure and after the therapy, rectification was visible in 72.0% patients according to another research work conducted in Pakistan [15]. Another case study found recovery of hundred percent especially in the children having less than two year of age [16]. In another case study, the recovery rate was 94.0% in the children of three year of age [17]. The removal of stones is the cause of better functioning of kidneys [18]. Nephrolithiasis has an association with CKD & ESRF as described in many studies [19]. The main aim of this study is to find out the rate of AKI in the patients of ureteric stone.

METHODS:

This research work was retrograde study based upon the observations conducted in a secondary health care

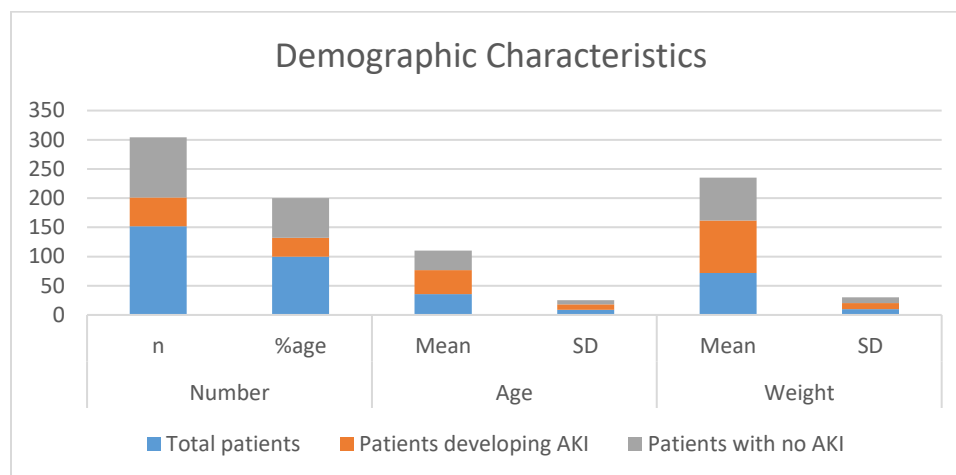
center located in Lahore. This work started in September 2017 & lasted up to the end of July 2018. All the patients who underwent URS (ureterorenoscopy) LASER DJS (DJ stenting) for the removal of stones in ureter were the part of this research work. 152 patients were the participants of this case study. Ethics committee of the hospital gave the approval for the start of the research work. The method of sampling which was in use for the sampling of the patients who underwent decompression method for the removal of the stones in the ureter. There were two groups of patients; Group-1 included the patients with acute kidney injury. Group-2 included the patients without acute kidney injury.

All the data of the patients collected for further investigation including demography, age, height, sex and any disease history. The measurement of the creatinine in the serum conducted in the start and at the end the decompression methods for each patient. Cock-croft Gault Formula was in use for its measurement. This procedure carried out for complete one month for every patient. The creatinine value monitoring carried out till it reaches the normal value. This value has a collected information carried out with the help of SPSS V.17. Categorical data presented with the help of frequencies & average \pm SD values were available to define the variables.

RESULTS:

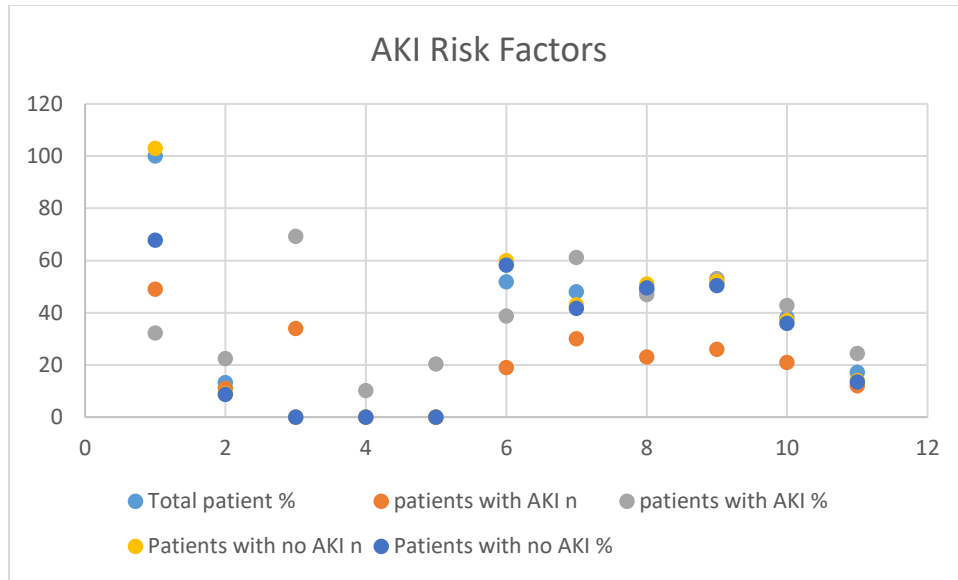
Total 152 patients were the participants of this research work. The average age of the patients was 35.840 ± 8.750 . No participant was female. All the patients were from 3 countries including India, Bangladesh & Pakistan. The demographic information is available in Table-1. The data displays that average weight was greater in patients with acute kidney injury vs without acute kidney injury (89.670 ± 9.990 kg vs 73.240 ± 10.1 Kg). The average age was also greater in the Group-1 as compared to the Group-2 (40.920 ± 9.160 years vs 33.420 ± 7.430 Years). We found the acute kidney injury in 32.20% patients.

	Number		Age		Weight		Gender
	n	%age	Mean	SD	Mean	SD	
Total patients	152	100	35.84	8.745	72.09	10.15	All males
Patients developing AKI	49	32.2	40.92	9.16	89.67	9.99	
Patients with no AKI	103	67.8	33.42	7.43	73.24	10.07	



Patients with acute kidney injury, 89.70 got recovery either incompletely (20.40%) or fully (69.30%). 42 patients out of 49 found CrCl from 60 to 89 ml/min, 5 out of 49 patients found with clearance of creatinine from 30 to 59 ml/minute & only 2 patients found with clearance of less than 30 ml/min. Co-morbidity & partial recovery was present in both of these patients. The analysis of the risk factors is available in Table-2.

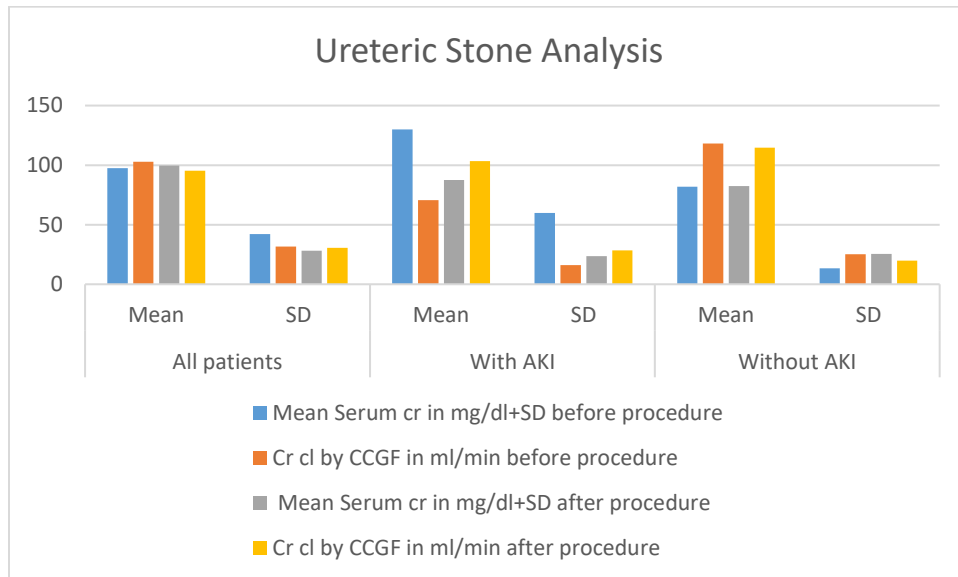
	Total patient		patients with AKI		Patients with no AKI	
	n	%	n	%	n	%
Number	152	100	49	32.2	103	67.8
Comorbidities (%)	20	13.2	11	22.4	9	8.7
Complete Recovery (%)	NA	NA	34	69.3	NA	NA
No recovery	NA	NA	5/49	10.2	NA	NA
Partial recovery	NA	NA	10/49	20.4	NA	NA
Upper ureteric stone	79	51.9	19	38.7	60	58.2
Lower ureteric stone	73	48.1	30	61.2	43	41.7
Rt ureteric stone	74	48.6	23	46.9	51	49.5
Left ureteric stone	78	51.3	26	53.1	52	50.4
Size of stone on ultrasound \geq 1cm	58	38.1	21	42.8	37	35.9
Bilateral stones	26	17.1	12	24.4	14	13.5



Lower stones of ureteric, bilateral stones & co-morbidity states were available in the patients found with acute kidney injury. The analysis of the collected information is available in Table-3.

Table-III: Data analysis in ureteric stone patients.

Name of variable	All patients		With AKI		Without AKI	
	Mean	SD	Mean	SD	Mean	SD
Mean Serum cr in mg/dl+SD before procedure	97.38	42.08	130.06	59.91	81.8	13.26
Cr cl by CCGF in ml/min before procedure	102.86	31.71	70.56	16.1	118.23	25.14
Mean Serum cr in mg/dl+SD after procedure	99.67	28.06	87.62	23.46	82.48	25.46
Cr cl by CCGF in ml/min after procedure	95.35	30.65	103.44	28.45	114.69	19.95



DISCUSSION:

The kidney stones are frequent & and increasing in the whole world according to many researches works [5]. The incidence of these diseases' changes from 1% to 20% [13]. Many case studies conduction carried out for the analysis of AKI in the patients of ureteric stone [5, 7, 15]. Firstly, most of the patients of this study got the stone development due to high sweating & poor water usage. This can be happened because of frequent nausea with increasing serious colic episodes. Final one takes us to the disruption in the dynamics of pressure in the capsule of Bowman, initiating reaction's cascade describing the objects damageable for nephrons [20]. The name of this phenomenon is Obstructive nephropathy. Kidney failure was 9.70 in another study conducted in Pakistan on 2838 patients, renal failure was available in 278 cases [15]. Another case work sowed the kidney failure of 80% [21]. The concluded rate of chronic diseases of kidneys among Indians is 17.20% but with stones, it is 5.30% [22].

High rate of 32.20% concluded in this research work. Total occurrence of the incidence of stone disease is very great in the countries of the gulf [23], hot weather is one of the most important factors affecting this disease. Bilateral stones of kidneys were present if five percent of the ureteric stones [24]. In this case work, the stones of bladder were available in 26 out of 152(17.10%). We found 12 cases in AKI and 14 cases in non-AKI group having bilateral stones. This is the same result in accordance with other case studies [25]. We found a complete recovery in 69.30% (n: 34) of acute kidney injury patients for whom after method Crcl gets the normal value of 90 & above. Ten patients got the partial recovery where Crcl value did not reach to the normal value. Hussain M reported rate of recovery in 72.0 patients [15]. Other research works reported the rate of recovery from 94 to 100% [16, 17]. Early intervention can cause the high rate of recovery.

LIMITATIONS OF THE STUDY

This research work conducted in a single health care center. The quantity of the patients was very low. All the participants of the case study were males and all patients were from the labor class of the industrial regions.

CONCLUSION:

Among the patients suffering from the stones in ureter found with acute kidney injury were about 32.0%. The most common risk factors according to this research work were weight of the patient, his old age, availability of bilateral stones, lower US & related co-morbidities. Most of the patients who were

developing acute kidney injury got recovery completely or incompletely after the application of the surgical methods for decompression to remove the obstruction.

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