



Obstructive Uropathy due to Urolithiasis an Oblivion Problem in an Underserved Population One Center Experience

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Abstract

Background: Obstructive uropathy in general has a serious impact on patients, that is if left untreated may alter their renal function to a degree that they may end with End Stage Renal Disease (ESRD).

Objectives: In this study we aim to estimate the incidence of obstructive uropathy due to urolithiasis & ESRD secondary to it in an underserved area.

Methods and Results: This prospective descriptive study was conducted in GHRDS; around 108 patients with obstructive uropathy due to stones were enrolled in the study. Gender distribution was (n=67) 62% male & (n=41) 38% female, almost more than 50% of the patients were of the age between 41 to 60 years. The second common age group was patients between 20 to 40 years which was 27.8% (n=30). Around 5.6% (n=6) of patients presented with anuria. Renal failure, either acute 3.7% (n=4) or acute or chronic kidney disease in 1.8% (n=2). The initial management was mainly supportive PCN 32.4%. DJ inserted for 28.7% of the patients. Three patients 2.8% underwent hemodialysis + PCN, 4.6% (n=5) URS and in 3.7% (n=3) Urethral Catheter was fixed. Further definite management was ESWL 26.9%. Patients treated with URS ± DJ were 27.8%. Surgery: P/L (16.7%), U/L (5.6%), Pyeloplasty (0.9%), Nephrolithotomy (4.6%) and Nephrectomy (6.5%). The outcome; retained renal normal function (75.9%), while 18.5% developed CRF, 5.6% with ESRD.

Conclusion: This study showed that the incidence of obstructive uropathy due to urolithiasis in GHRDS was 15.3%. The incidence of renal impairment was 24.1%, from the all treated patients 5.6% of patient ended with ESRD.

Introduction

Obstructive uropathy is accounted to be a common cause of ESRD in Sudan. In many Arab countries, obstructive uropathy constitutes a major cause (40%) of ESRD [1]. In previous study in 2009 in Gezira Hospital for Renal Disease and Surgery GHRDS, obstructive nephropathy was found to be the 4th leading cause of ESRD [2]. In Gezira hospital for renal disease and surgery, stone disease is common presenting condition. Since the beginning of the hospital in 2005, 10 years ago according to hospital statistics, stone disease is increasingly becoming the most common urological disease in the hospital since 2005, it counts about 11.3% of total patients who were treated in the hospital. In 2006, they were count 12%. In 2014, they were representing 14.5%. In 2015 period from January to September they represented 14.8% from total of patients seen in the hospital [1,2].

Urolithiasis is a relatively common problem 3 to 6. In the United States, almost 2 million outpatient visits for a primary diagnosis of urolithiasis were recorded in 2007. Up to 12 percent of men and 5 percent of women will have at least one symptomatic stone by the age of 70 [3] over 80 percent of these stones will contain calcium, usually as calcium oxalate.

The prevalence of kidney stones appears to be increasing in the United States. In a report from the Third National Health and Nutritional Examination Survey, the prevalence increased from 3.8% to 5.2% in the period 1976 to 1980 compared with 1988 to 1994, respectively [3]. Furthermore, the male to female ratio has changed over the past 25 years, from 3:1 (male:female) to now less than 2:1 [7,8]. Whether this represents an actual increase in incidence or an increase in detection is uncertain [5]. If true, some have speculated that it is due to changes in life-style factors, such as increasing

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obesity among women [9].

The prevalence of nephrolithiasis varies regionally. In one study of over 40,000 men between the ages of 45 and 70, the risk of having a history of kidney stones was 13 and 31 percent lower in the mid-Atlantic and northwestern regions, respectively, compared to the southeastern United States [10]. A second study confirmed this regional variation, but found that differences were greatly reduced after adjustment for temperature, sunlight, and beverage consumption [11].

The prevalence of nephrolithiasis increases with age is slightly higher in men compared with women, and in whites compared with blacks, Asians, and those of Hispanic ethnicity [12-14]. Although urinary calcium excretion tends to be lower in blacks [14,15], other urinary factors are similar among patients of different races and ethnicities.

Material and Methods

This is a prospective descriptive small-scale hospital-based study, in magnitude of urolithiasis in obstructive uropathy, in Gezira Hospital for renal disease & surgery GHRDS, GHRDS is the only tertiary center that treat renal diseases outside the capital, in the a real underserved area. That is equipped with staff composed of consultants, specialists, residents, residents under training, and variant equipment that’s necessary for diagnosing & treating patient with wide range of nephrological & urological problems from infections to transplantation, and its wide range of catchment area from nearby states and even nearby African countries. This makes it necessary to participate in building data for medical planning & health evaluation strategies by the authorities.

The study includes all patients of obstructive uropathy due to urolithiasis treated in Gezira hospital for renal disease & surgery in this period. Sample size was determined by total coverage method to include all patients attended during the study period and they were 121 patients, the response rate was 100%, but after excluding cases with missed data the final sample size was 108 participants.

Results

Table 1 showed age and sex distribution of the studied group where male:female ratio equal 1.6:1 (67/42), mean age was 46 ± 2.66 years.

Pain was the commonest presenting symptom in 94.4% (n=104), followed by UTI and LUTS for (75% (n=81), 66.7% (n=72) respectively. While Features of anemia and hematuria were in 35.2% (n=38), 24% (n=26). respectively, and the least were features of uremia and anuria about (12.9% (n=14) and 10.9% (n=11)), respectively (Table 2 and Figure 1), studying the time of presentation of the patients, showed that about two third of patients presented late 68.5% (n=74), while one third presented early 31.5% (n=34), the most common causes of late presentation were found to be as follows; non awareness was the stated in (55.6%) followed by financial & transportation problems, misdiagnosis and lack of service as less frequent causes. Most of the patients had normal hemoglobin 74.1% (n=80), while 7.4% (n=8) had anemia, infection in form of high white blood count and CRP was shown in 8.3% (n=9) besides 10.2% (n=11) had both anemia and infection. Around 77.8% (n=84) of patient had normal renal profile, while impaired renal function was shown in 22.2% (n=24). The urinalysis, hematuria was the most common finding 48.1%, followed by UTI 32.4% (n=35), while 17.6% (n=19) had clear urine [Table 3]

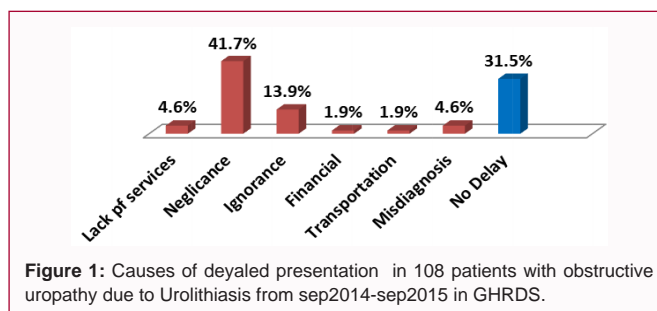


Table 1: Distribution of Age & sex for 108 patients with obstructive uropathy due to stone in period sep 2014 - sep 2015 in GHRDS.

Age	Male	Female	Total
<20 year	4 (3.7%)	6 (5.6%)	10 (9.3%)
20-40 year	18 (16.7%)	12 (11.1%)	30 (27.8%)
41-60 year	38 (35.2%)	17 (15.7%)	55 (50.9%)
61-80 year	7 (6.5%)	6 (5.6%)	13 (12.03%)
Total	67 (62%)	41 (38%)	108 (100%)

Table 2: Pattern of presentation for 108 patients with obstructive uropathy due to stone in period sep 2014 - sep 2015 in GHRDS.

Clinical feature	Number	Percentage%
Pain	106	94.40%
LUTS	72	66.70%
UTI	81	75%
Anurea	11	10.90%
Hematuria	26	24%
Features of uremia	14	12.90%
Features of anemia	38	35.20%

Table 3: Laboratory Investigations for 108 patients with obstructive uropathy due to stone in period sep 2014 - sep 2015 in GHRDS.

		Frequency	Percentage%
CBC	Anemia	8	7.40%
	Infection	9	8.30%
	Both	11	10.20%
	Normal	80	74.10%
RFT			
	S. creatinine		
	<1.4 mg/dl	84	77.80%
	1.4-2.4mg/dl	3	2.80%
	>2.4 mg/dl	21	19.40%
B. urea	<50mg/dl	84	77.80%
	50-100mg/dl	6	5.60%
	>100mg/dl	18	16.70%
Urinalysis	Hematuria	12	11.10%
	UTI	35	32.40%
	Granular cast	1	0.90%
	Normal	19	17.60%
	UTI + Granular cast	1	0.90%
	Hematuria + UTI	40	37%

47.2% of stones were ureteric, of these 38.8% (n=42) were unilateral ureteric stones, while 8.3% (n=9) were bilateral. Renal stones were

found to be 38.9% (n=42), of these 27.8% (n=30) unilateral renal stone while 11.1% (n=12) were bilateral. Also, we found combined (ureteric and renal) stones in 12.1% (n=14), Vesical stone was in 0.9 (n=1). The initial management offered for the patients. DJ inserted in 28.7% (n=31), PCN in 27.8% (n=30), hemodialysis + PCN in 2.8% (n=3), URS in 4.6% (n=5), and Urethral catheter in 3.7% (n=4). In the final management done for the patients ESWL in 26.9%, URS ± DJ in 27.8%, while open surgery was needed in form of Pyelolithotomy in 16.7%, Ureterolithotomy in 5.6%, Pyeloplasty in 0.9%, nephrolithotomy in 4.6% and nephrectomy 6.5%. The outcome of the stone clearance showed that 62% were successfully cleared, while 32.4 had residual stones. The outcome of renal function was; 75.9% had retained their normal renal function, while 18.5% developed CRF, 5.6% end with ESRD. Renal impairment was yielded in renal stones about 14 patients 53.8%, while seven patients 26.9% had ureteric stones, combined renal and ureteric stones were shown in five patients 19.2%.

Discussion

The study showed the distribution of sex as; male (n=67) 62%, female (n=41) 38%, male to female ratio was 1.6:1, almost more than 50% of the patients were in category of age between 41 to 60 years there were 50.9% (n=55) patients, the second common age group was patients between 20 to 40 years which was 27.8% (n=30). Then patients less than 20 years were 9.3% (n=10), many patients who were in this category were referred to Khartoum for dialysis and continue their further management there after they had their initial management like insertion of PCN in GHRDS & patient who were between 61 to 80 years were 13 patients representing 12% of the population of the study, which correlate with local study [16], and also consistent with regional study in Southwestern Nigeria [17], International study [18].

The main bulk of patients occupations were unemployed 29.6% and farmers were 20.4%, labor 16.7%, employed 15.7%, others were 18 patients representing 16.7% of study patients, most of the unemployed patients were housewives, the second most common occupation was farmers, this could be reflected to that 72% of patients are from Gezira which is one of the most important agricultural region in the country.

The pattern of presentation for urolithiasis in general was; pain was a main complain in 94.4%, which is higher in comparison to local study 46, others had no pain at all, some of them where accidentally diagnosed with ultrasound scanning for other complains, this may be explained by marked delay in presentation to health institutes reflected to many factors like, negligence, ignorance, use of medical therapies, misdiagnosis and sometimes financial difficulties that delayed their presentation.

El Imam et al. [19], conduct a retrospective cross-sectional multicenter study conducted at the Gezira Hospital for Renal Diseases and Surgery, the Gezira National Center for Pediatric Surgery, and the Madani Maternal Hospital. All age groups were included. All patients with a confirmed diagnosis of obstructive uropathy were included; it showed anuria in about 4%, while this study also showed (10.2%) (n=11) patients came with anuria. Patients with anuria had almost presented with acute or acute in chronic renal impairment 9.3% and 2.8%, respectively. This reflect that the obstructing stone were not common bilaterally & large enough to cause the obstruction.

Hematuria was seen in (n=26) 24.1%, which is twofold the international studies (14%), this may be reflected to ignorance & negligence of patient with their disease that delay their presentation

to degree that causing macroscopic hematuria, which also higher than previous local study [20]. With the advent of Shock Wave Lithotripsy (SWL), the miniaturization of flexible endoscopes, laser fibers with diameters measured in microns and, perhaps most importantly, Computerized Tomography (CT), modern stone management and the definition of operative success have changed. While urologists still debate which method-SWL or Ureteroscopy (URS) -is best to treat ureteral stones, a prospective matched cohort of patients showed that SWL and URS were equally efficacious when using the Dornier HM3 lithotripter but that patient tended to prefer SWL [21].

In Glickman Urological and Kidney Institute, study in 2015 showed; of patients with recurrent urinary tract infections and asymptomatic renal calculi 50% may be rendered infection-free following stone extraction. Patients with risk factors for recurrent infections after surgery should be counseled that stone extraction might not eradicate the infection [22]. Our concerning with outcome of infections: That ranging from UTI, wound infection, burst abdomen that it measure the quality of life after the treatment was, 73.1% get retained good life style without infections, 23.1% suffered from UTI, while 2.8% progressed to sepsis, which result in readmission to hospital again for better management.

The striking finding that: In studying patients with anuria & outcome of renal functions, revealed that from in patient with no anuria (90%): 5.6% of patient developed ESRD, 13.9% developed CRD, while in patient with anuria (10.2%) only 4.6% of patient who end with CRD, 5.6% retained normal function & no one end with ESRD. Unfortunately, 5.6% of patients were died in the period of follow up with sepsis or ESRD, 2 with ESRD, 2 with sepsis, and 2 with both sepsis and ESRD.

Conclusion

The outcome of renal function however, is determined through the time of presentation, initial state of the kidneys & time and mode of treatment. Obstructive uropathy can simply be treated with ESWL, in stones measures less than 2 cm, which has excellent results, when done by experienced urologists & residents.

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