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The Impact of Poverty, Level of Education and Missed Diagnosis on the Outcome of Management of Obstructing Stone: A Paradigm of Poor Urology Service

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Abstract:

Objective:To study the causes and outcome of delayed presentation in patients with obstructive uropathy due to stones in a tertiary referral hospital in Central Sudan.

Methodology: This is a prospective cross-sectional hospital based study carried out in the urology department of the Gezira Hospital for Urology and Renal diseases.

Results:The total number of the study group was 140 patients. The mean age at presentation was 42.17±16.975 year with a male-to-female ratio of 1.7:1. The period from the time of onset of symptoms to the time of diagnosis was less than two weeks in 21.2% of cases and more than two weeks in 78.5% of cases. The reasons of delayed presentation (> two weeks) included missed management by healthcare professionals in 85 (60.7 %), patients ignorance in 16 (11.5%), and financial issues in 9 (6.4%) patients. At presentation, 25.7% of patients presented with abnormal renal function. Post intervention, complete recovery was achieved in 50% of patients with impaired renal function. The degree of renal recovery was dependent primarily on duration of symptoms.

Conclusion:This study has shown that there was delayed presentation of patients with obstructive uropathy due renal stones in our setting. Missed management by healthcare professionals was the most common cause of delayed presentation. The duration of symptoms was directly related to post intervention serum creatinine levels. Efforts at improving awareness and early diagnosis among the health team should be made to improve treatment outcome.

Key word: Nephrostomy, Obstructive uropathy, Complications rate, Hydronephrosis

Introduction:

Urolithiasis is very common among men and women with estimated prevalence among the population of 2–3% and an estimated lifetime risk of 12% for white males and 5–6% for white females⁽¹⁾.

A seasonal variation is also seen, with high urinary calcium oxalate saturation in men during summer and in women during early winter. Stones form twice as often in men

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as in women. The peak age in men is 30 years; women have a bimodal age distribution, with peaks at 35 and 55 years⁽²⁾.

The explanation for the lower pediatric incidence is unknown, but may be due in part to the higher concentrations of crystal formation inhibitors such as citrate and magnesium in the urine of children compared with adults⁽³⁻⁴⁾.

Urolithiasis is common throughout the Sudan with the exception of the southern region where it is rare. The latter region is cooler and decidedly more moist than the other provinces during the hot months of the year (May-October). In the Northern provinces urolithiasis is commoner in areas with lower relative humidity⁽⁵⁾.

Acute Kidney Injury (AKI) is an important cause of morbidity and mortality in developing countries. About 8.5% of AKI in Sudanese children due to urinary tract obstruction by stone⁽¹²⁾. Hypertension and obstructive uropathy are the leading causes of end stage renal disease in Gezira state, Sudan⁽⁶⁾.

Obstructive uropathy due to stones are treatable conditions with good prognosis. Early presentation enables early diagnosis and intervention. In this study determined the causes and outcome of delayed presentation in patients with obstructive uropathy due to stones in a tertiary referral urology hospital in Central Sudan.

Methodology:

Objectives: The aim was to determine the effect of poverty, the level of education and delayed presentation on the outcome of treatment of patients with obstructing stone

Setting: The patients were from the Department of Urology, Gezira Hospital for Renal Disease and Surgery (GHRDS), which is a tertiary referral hospital for the Gezira state.

Study design: This is a prospective cross-sectional hospital based study.

Study period: 1st of March 2015 to 30th of Sep 2015

Study population: Patients who presented with obstructed kidneys due to urolithiasis with delayed presentation during the research period. Patients had regular follow-up (on Day ten and after six weeks from open intervention or endoscopic procedures with or without stent). Patients who presented with obstructed kidney due to other causes of obstruction (e.g. Tumor, stricture, etc.) were excluded.

Preoperative and postoperative evaluation: Patients were initially assessed by adequate history, examination and investigations, which included serum creatinine (normal serum creatinine= <1.4 mg/dl), ultrasound kidney, ureter and bladder (KUB) were done routinely for all patients. CT-KUB and/or intravenous pyelogram were done to confirm the diagnosis and to determine the level and site of the stone. Retrograde and antegrade Pyelography were performed in a fewer number of patients. Surgery (open or endoscopic) was done by consultant, specialist or registrar. Urgent intervention such as percutaneous nephrostomy (PCN), ureteric stent or dialysis were done when indicated then followed by definitive management either open surgery (pyelolithotomy, nephrolithotomy or ureterolithotomy) or endoscopic (ureteroscopy plus holmium Laser fragmentation) with or without ureteric stent (DJ).

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Informed consent was taken from all the patients before surgery. All procedures were done under general anaesthesia except lower ureteric stone in adult which was done under spinal anaesthesia. In open surgery patients were admitted for three to five days postoperative and discharged after removal of drain while patients who underwent URS were usually discharged after 24 hours postoperatively. Patients came back to the hospital after ten days from the day of surgery and then after six weeks for follow up and ureteric stent (DJ) removal.

Patients were followed during these visit with history, examination, S.creatinine and image (KUB X ray or ultrasound). The successful of intervention means no obstruction and recovery of serum creatinine either completely (S.creatinine less than 1.4mg/dl) or partially (decrease in S.creatinine in comparison with pre intervention S.creatinine and did not need dialysis).

Data analysis and statistics: Constructed flow chart was used to collect data. Then data was analysed by using computer program Statistical Package for Social Sciences (SPSS), dependent and independent variables were considered as significant if P-value <0.05.

Results:

This study was conducted at Gezira Hospital for Renal Disease and Surgery in the period from 1st March 2015 to Sep 2015. The total number of the study group was 140 patients. The mean age at presentation was 42.17 ± 16.975 year with a male-to-female ratio of 1.7:1. Distribution of cases according to the level of education is shown in figure 1.

The period from the time of onset of symptoms to the time of diagnosis was less than two weeks in 21.2% of cases and more than two weeks in 78.5% of cases. Relation between level of education and duration of symptoms is shown in (Table1).

The reasons of delayed presentation (> two weeks) included missed management by healthcare professionals in 85 (60.7%), patients ignorance in 16 (11.5%), and financial issues in 9 (6.4%) patients.

At presentation, 104 (74.3%) cases presented with normal renal function and 36 (25.7%) presented with abnormal renal function. Patients with renal failure were required initial management in a form of ureteric stenting, PCN or definitive intervention. Complete recovery from renal impairment was achieved in 18 cases and partial recovery in 18 cases and all cases who had partial recovery presented more than 4 weeks from onset of symptoms (Table 2)

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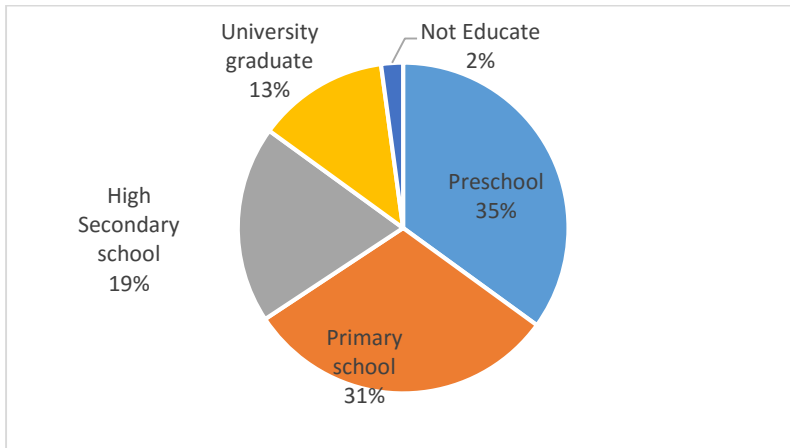


Figure (1): Distribution of cases according to level of education

Table (1): Distribution of study population according to level of education and time from presentation to diagnosis(n=140).

level of education	Duration of symptoms (Weeks)				Total
	< 2	3 - 4	5 - 8	> 9	
Preschool	5	2	6	36	49
Primary school	10	0	4	29	43
High Secondary school	6	2	0	19	27
University graduate	8	1	1	8	18
Not Educate	1	1	0	1	3
	30	6	11	93	140

P value=0.0037

Table (2): Outcome of the study population according to time from presentation to diagnosis(n=140)

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Duration of symptoms	Cases with normal renal function	Post intervention S.creatinine for cases with impaired renal function		Total
		Partial Recovery	Complete Recovery	
< 2 Weeks	26	0	4	30
2 - 4 Weeks	3	0	3	6
5 - 8 Weeks	10	1	0	11
≥ 9 Weeks	65	17	11	93
Total	104	18	18	140

Discussion:

Calculi are the most common causes of unilateral ureteral obstruction. Obstructive uropathy due to renal stones are treatable conditions with good prognosis. Most of these stones can be easily identified by imaging⁷. In this study it was found that stone disease as a cause of obstructive nephropathy is commoner among males than females which was compatible with other studies⁽⁸⁻⁹⁻¹⁰⁻¹¹⁾.

Delay in diagnosis can have an adverse impact on the management of this condition. This study showed that about 78.5% of patients with obstructive uropathy due to renal stones are “delayed presenters”. The analysis of the causes of delayed presentation showed that missed management by healthcare professionals was the most common cause. This may be because most of cases were from rural areas where diagnostic imaging were not available. In addition the healthcare poor referral system could be a cause of late presentation. Worldwide level of education is not the yard stick for the progression of the disease, but in developing countries generally and in Sudan particularly, the level of education is an important factor in the early presentation and progression of disease, accordingly we found most of our patients who presented late were primary school or less (67.8 %). Moreover the relation between level of education and duration of symptoms was inversely related.

Delayed presentation has been shown to be associated with poor prognosis in patients with obstructive uropathy due to renal stones, and this may not be reversed even with relief of obstruction. In the current study the duration of symptoms was inversely related to post intervention serum creatinine levels.

Early presentation enables early diagnosis and intervention. This reduces the incidence of complications. Several studies have shown better preservation of renal function with early intervention and relief of obstruction⁽¹⁰⁻¹¹⁾. Renal impairment is often-reversible and

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the degree of renal recovery depends primarily on the extent and duration of the obstruction⁽¹¹⁾

In the current study 7 cases presented within four weeks or less after onset of symptoms completely recovered from renal impairment. Therefore, with early presentation, diagnosis, and treatment the outcome is expected to improve.

In this study 25.7% (n=36) of patients had renal function impairment at presentation that required urgent intervention. Total renal recovery occurred in 18 cases in this study and was partial in 18.

This study has some limitations. It was a single institution experience so the results may not be generalized. However, this study provides background data that will contribute to raise awareness and enhance further research in this domain.

In conclusion, this study has shown that there was delayed presentation of patients with obstructive uropathy due renal stones in our setting. Missed management by healthcare professionals was the most common cause of delayed presentation. The duration of symptoms was directly related to post intervention serum creatinine levels. Efforts at improving awareness and early diagnosis among the health team should be made to improve treatment outcome.

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Experience from a Sub-Saharan African Unit.Perit Dial Int July-August 2014 vol.
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