

Research Article**Renal Status Of Patients With Bladder Outlet Obstruction (BOO) At Presentation at Ladoke Akintola University of Technology Teaching Hospital, Osogbo, South Western Nigeria****Amogu K. Eziiyi¹, Olalekan E. Ojo², Abimbola. O. Olajide*¹, Nurudeen O. Bello³, Adekunle A. Adeyemi¹, Ismail A. Oyebiyi¹**¹Department of Surgery LAUTECH teaching Hospital, Osogbo, Nigeria²Department of Medicine, Federal Medical Center, Owo, Nigeria³Department of Obstetrics and Gynecology, LAUTECH teaching Hospital, Osogbo, Nigeria***Corresponding author**

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Abstract: Bladder outlet obstruction describes various urological conditions in which urine outflow from the bladder through the urethra is impeded. It is a common presentation in our practice and often complicated by renal impairment, probably due to late presentation of patient. The objective of present study is to ascertain renal function of patient with BOO at presentation vis-à-vis their duration of symptom and to find out common causes of BOO in our environment. All patients who presented with BOO between January 2010 and December 2012 were studied. Details of their renal function at presentation were reviewed. A total of hundred patients aged 8-90 years were studied, modal age group were 61-70 (43%) in all 41% of patient had urethra stricture, 40% had benign prostatic hyperplasia while 19% had carcinoma of the prostate. All patients had their renal status assessed at presentation, 71% had renal ultrasound scanning while all patient had urea, creatinine and their GFR estimated. Ten percent of patient had poor corticomedullary differentiation, 20% had elevated urea, and 31% had elevated creatinine while 79% of the patient had abnormal estimated GFR. In conclusion, commonest cause of BOO was prostatic diseases and significant number of the patient studied had renal impairment at presentation.**Keywords:** Bladder outlet obstruction, renal function, renal impairment at presentation

INTRODUCTION

Bladder outlet obstruction (BOO) is the impedance or blockage of urine outflow from the bladder into the urethra [1]. In the world today, one of the complications that could arise with patients with bladder outlet obstruction is renal failure, this has been associated with prolong urinary retention. The causes of BOO are numerous and vary incidence from one region to another [1]. Benign prostatic hyperplasia is the most common cause of bladder outlet obstruction in men older than 50 years of age [2]. Benign prostatic hyperplasia (BPH) [3], carcinoma of the prostate (CaP) [4] and urethra stricture are the leading causes of bladder outlet obstruction.

Hospital records of all patients who presented with Bladder outlet obstruction between January 2010 and December 2012 were analyzed. Among other variables, information on patient biomedical data, duration of symptoms, probable cause of bladder outlet obstruction, renal status at presentation, ultrasound assessment was done.

We found out that 12.2% of all patient that had renal ultrasound scanning had poor corticomedullary differentiation [Table: 1], 20% had elevated urea, and 31% had elevated creatinine while 78% of the patient had abnormal estimated GFR [Table 2]. There is significant statistical relation between the cause of BOO and the renal status of the patients ($P < 0.05$)

PATIENTS AND METHODS

Hospital records of all patients who presented with Bladder outlet obstruction between January 2010 and December 2012 were retrieved from the medical records department of the hospital. Among other variables, information on patient biomedical data, duration of symptoms, probable cause of bladder outlet obstruction, renal status at presentation, ultrasound assessment of bladder thickness, ureter and renal corticomedullary differentiation at presentation, estimated glomerular filtration rate (eGFR) was calculated as a measure of renal status for each patient, as well as transrectal ultrasound scanning (TRUSS),

histology of prostate specimen and retrograde urethrocytography (RUCG) findings where applicable were extracted and the data was entered in a spread sheet. Data were analyzed using the Statistical Package for the Social Science (SPSS) 16.0 version for measures of central tendencies and frequency.

RESULTS

A total of hundred patients presented with bladder outlet obstruction during the study period. Age range was 8 – 90 years, modal age group were 61-70 (43%) in all 41% of patient had urethra stricture, 40%

had benign prostatic hyperplasia while 19% had carcinoma of the prostate. All patients had their renal status assessed at presentation, 71% had renal ultrasound scanning while all patient had urea, creatinine and their GFR estimated. 12.2% of all patient that had renal ultrasound scanning had poorcorticomedullary differentiation [Table: 1], 20% had elevated urea, and 31% had elevated creatinine while 78% of the patient had abnormal estimated GFR [Table 2]. There is significant statistical relation between the cause of BOO and the renal status of the patients (P<0.05)

Table 1: Frequency Table for Renal Corticomedullary Differentiation.

	Frequency	percentage	Valid Percentage
Good	59	59.0	72.0
Poor	10	10.0	12.2
Preserved	2	2.0	2.4
Not done	11	11.0	13.4
Total	82	82.0	100.0

*12.2% of all patient that had renal ultrasound scanning had poor corticomedullary differentiation

Table 2: Frequency Table of eGFR

	Frequency	Percent
Normal	22	22.0
Abnormal	78	78.0
Total	100	100

* 78% of the patient had abnormal estimated GFR

DISCUSSION

Bladder outlet obstruction is a common presentation in our practice and often complicated by renal impairment due to late presentation of our patients. Bladder outlet obstruction (BOO) is the impedance or blockage of urine outflow from the bladder into the urethra [1]. In the world today, one of the complications that could arise with patients with bladder outlet obstruction is renal failure, this has been associated with prolong urinary retention. The causes of BOO are numerous and vary incidence from one region to another [1]. Benign prostatic hyperplasia is the most common cause of bladder outlet obstruction in men older than 50 years of age [2]. Benign prostatic hyperplasia (BPH) [3], carcinoma of the prostate (CaP) [4] and urethra stricture are the leading causes of bladder outlet obstruction. A prevalence of 25.35% have been observed for BPH in Nigeria [3] which is similar to the prevalence of 25.30% in United Kingdom [5] and closer to the prevalence of 24.94% in Spain [6]. A prevalence of 1.04% have been observed for CaP in Nigeria [4], lower than 1.56% observed in white American men [7]; However the incidence in black African community may be underestimated [8, 9]. Although the true incidence of urethral stricture in men is not known [10], a rate as high as 0.6% has been observed in some susceptible population [11].

Pathophysiology of renal failure from urinary retention: when the bladder becomes over distended as a result of BOO, the bladder is thickened and kinked the terminal ureters as it traverses it. Hockey stick deformity of the terminal ureters occurs associated with failure of the uretero-vesical valves, vesico-ureteric reflux, bilateral hydroureters and hydronephrosis. The increased intrapelvic pressure from hydronephrosis destroys the renal papillae nephrons and parenchyma leading to impaired renal function [12].

To assess renal status of patients, plasma urea and creatinine as well as estimated creatinine clearance are still in use [13]. Plasma urea is not specific to assess renal status, because its formation is influenced by a number of factors such as liver function, protein intake and rate of protein catabolism. Urea excretion also depends upon hydration status and the extent of water reabsorption [13] some of which can lead to its elevation. Change in serum creatinine concentration more reliably reflects changes in glomerular filtration rate (GFR) than do changes in serum urea concentration [13], serum creatinine concentration is widely interpreted as a measure of renal function in clinical practice [14]. GFR is considered the best marker as well as the best overall measure of kidney function [15, 16, 17, 18]. Based on these facts, clinicians now rely more on the ratio of plasma urea and creatinine in accessing renal status [13]. Furthermore, measured creatinine

clearance / glomerular filtration rate (GFR) and estimated creatinine clearance are also used [14].

In view of the morbidity and mortality that is associated with renal failure, its prevention is worthwhile. To prevent renal failure is to prevent its various causes. Early detection of renal failure that could arise from chronic urinary retention may improve treatment outcome. This study was therefore designed to measure plasma electrolyte, urea and creatinine as well as estimated GFR in their first contact of patients with urinary retention as a result of bladder outlet obstruction.

Many studies were done to achieve a scientific relation between lower urinary tract symptoms and renal impairment, however until recent years there was

no palpable evidence connecting these two entities [19], Rule and Lieber in 2005 shows that there was a cross-sectional association between signs and symptoms of BOO and chronic kidney disease in community-dwelling men [20].

Despite the many possible causes of obstructive uropathy, the most common among all patients was BPH [19,21,22], these are similar to findings in this study in which 37 (92.5%) of patients that presented with BPH had renal impairment followed by prostate cancer and urethral stricture 89.5% and 60% respectively [Table 3]. However the finding of 60% renal impairment in the urethral stricture group in this study is higher than 12% of renal impairment reported in a study of patient who had one stage urethroplasty for urethral stricture [23].

Table 3: Relationship between Cause of BOO and renal status

	Renal Status (eGFR)			
	Normal n(%)	Abnormal n(%)	Pearson Chi-Square	P-value
Cause of BOO				
CAP	2(10.5%)	17(89.5%)	14.247	0.001*
BPH	3(7.5%)	37(92.5%)		
Urethral stricture	16(40.0%)	24(60.0%)		

*There is significant relation between the cause of BOO and the renal status of the patients (P<0.05)

Hill et al in a retrospective study did not find any relationship between duration of symptoms and serum creatinine [24], this study show more number of patient with normal renal function in those that present early compare to those that present late, however there is no significant relation between duration of symptoms and renal status (P>0.05). Both urinary outflow obstruction and degradation of renal function are extremely common among aging male, leading some to suggest that it is a natural concomitant of aging [25], however there is no significant statistical relation

between the age of patient and the renal status of the patients (P>0.05) in this study [Table 4].

Chronic kidney disease is a serious condition associated with premature mortality, decrease quality of life and increase health-care expenditures, untreated chronic kidney disease can result in end-stage renal disease requiring dialysis or kidney transplantation. Late or end stage renal failure secondary to BOO should be amenable to prevention if cases are recognized early [19].

Table 4: Relationship between age of the patient and renal status

	Renal Status (eGFR)			
	Normal n (%)	Abnormal n (%)	Pearson Chi-Square	P-value
Age of the patient				
Less than 10years	1(50.0%)	1(50.0%)	4.602	0.799*
11 - 20year	1(50.0%)	1(50.0%)		
21 - 30years	0(0.0%)	3(100.0%)		
31 - 40years	1(25.0%)	3(75.0%)		
41 - 50years	1(50.0%)	1(50.0%)		
51 - 60years	1(20.0%)	4(80.0%)		
61 - 70years	7(16.3%)	36(83.7%)		
71 - 80years	7(24.1%)	22(75.9%)		
81 - 90years	2(22.2%)	7(77.8%)		

*There is no significant relation between the age of patient and the renal status of the patients (P>0.05)

Limitations

In this study, renal status of patients were measured only at presentation, a follow up renal

assessment pre and post definitive treatment would have been better to know those patient whose renal

status improved, remained the same or worsen after treatment and to stage their renal insufficiency.

CONCLUSION

Bladder outlet obstruction is common in our clinical practice, commonest cause of BOO was prostatic diseases, significant number of the patient studied had renal impairment at presentation and there was signification statistical relation between the cause of BOO and the renal status of the patients.

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