SAS Journal of Surgery ISSN 2454-5104
SAS J. Surg., Volume-2; Issue-4 (Jul-Aug, 2016); p-156-160
Available online at http://sassociety.com/sasjs/

Original Research Article

Causes of Bladder Outlet Obstruction in Adult Males, Relative Frequency and Mean Age at Diagnosis

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Abstract: Bladder outlet obstruction (BOO) occurs whenever there is an impediment to urine flow and emptying from the urinary bladder. It is a major health issue especially in ageing males. The objective of this study was to establish the most frequent cause of this condition among adult males that presented to our facility. A 12-month retrospective review of case notes of patients who presented with BOO between October 2013 and September 2014. Data retrieved included age, clinical features, mode of diagnosis and treatment modalities. A total of 106 patients were evaluated with a mean age 61.72 (SD± 11.048) ranging from 20-93 years. Of this number 34 patients (32.7%), 55 patients (51.9%) and 17 patients (15.4%) were diagnosed with Cancer of the prostate (Cap), Benign prostatic hyperplasia (BPH), and Urethral stricture respectively. Mean age at diagnosis were as follows: 65.35 years (SD±7.010), 62.43 years (SD±7.94), 46.70 years (SD±14.63) respectively of Cap, BPH and Urethral stricture. From the result, BPH was the commonest cause of BOO and the mean age at diagnosis was higher for Cap patients than for other group of patients.
Keywords: Bladder outlet obstruction, causes, relative frequency, age, diagnosis

INTRODUCTION:

Abdur-Rahman *et al.;* [1] defined bladder outlet obstruction as impedance or blockage of urine outflow from the bladder into the urethra. This condition can be seen in both male and female at all age groups but commoner in ageing males due to BPH, Cap and urethral stricture from anatomical obstruction [2]. The obstruction is usually manifested with lower urinary tract symptoms (LUTS) which may be obstructive, irritative or both. Obstructive symptoms include poor urinary stream, hesitancy and straining, intermittency and a feeling of incomplete bladder emptying. The irritative or storage symptoms are majorly frequency, urgency with urgency incontinence, nocturia and or dysuria. These symptoms may be very distressing and could affect the quality of life of the patients.

In this study, the mean age at diagnosis of the various causes of bladder outlet obstruction is highest in patients with Cap (65.4 years), usually increasing steadily from 65 years of age [3]. In BPH the mean age at diagnosis is still in the 7th decade of life (62.43 years), this was also documented by Damir *et al.;* [4] in his study of a better indicator of BOO in patients with benign prostate hyperplasia. Similar results were obtained in hospital-based studies among Nigerians; Ahmed *et al.;* [5], Ibinaiye *et al.;* [6] and Badmus *et al.;* [8] who reported mean ages of 62.5, 64.1 and 64.4 years respectively. Patients with urethral stricture are usually younger than those with Cap or BPH[8]. This study further strengthens the importance of appreciating the causes of BOO and the value of age as it relates to the various diagnostic entities.

PATIENTS AND METHODS:

A retrospective study of one hundred and six (106) patients who were seen on first visit at the urology clinic of the University of Uyo Teaching Hospital with symptoms of Bladder outlet obstruction. Information was retrieved from their case notes covering a period of 12 – months, from October 2013 to September 2014. The necessary data were age, clinical features and various diagnostic modalities. The various diagnoses were Cap, BPH and Urethral Stricture. Investigations done to diagnose Cap were Prostate Specific Antigen (PSA) and Prostate Biopsy, these tests also ruled out BPH. Micturating Cystourethrogram (MCUG) and Retrograde Urethro Cystogram (RUCG) were done to diagnose Urethral Stricture. Data was analysed using Statistical Package for social sciences software version 20 (SPSS 20.0) and results were represented in tables, figures and also used for the discussion.

RESULTS:

One hundred and six (106) patients were seen and evaluated. Thirty four (34) patients representing 32.7%, Fifty five (55) patients representing 51.9% and seventeen (17) patients representing 15.4% were

diagnosed with Cancer of the prostate (Cap), Benign prostatic hyperplasia (BPH) and Urethral stricture respectively (Table 2). Age range was between 20 to 93 years with a mean age of 61.72 (SD± 11.04). Mean age at diagnosis for the various conditions were as follows 65.35 (SD±7.010) years for Cap (range 55-84), 62.43 (SD±7.94) years for BPH (range 48-93) and 46.70 (SD ±14.63) years for Urethral Stricture (range 20-72) (Figure 2). For cancer of the prostate, the highest number of patients presented in their 7th decade of life (19/34 = 55.9%), BPH patients were also more in their 7th decade (27/55 = 49.1%) while urethral stricture patients were seen most in their 6th decade of life (5/17 = 29.4%) (Table 1). There was a statistically significant relationship between age of respondents and the causes of bladder outlet obstruction (p value < 0.05) (Table 3).

Tables 1: Age Distribution of Patients (in decades):

Age (in decades)	Cap (n=34)	BPH (n=55)	Urethral Stricture (N=17)
2nd	-	-	1 (5.9%)
3rd	-	-	1 (5.9%)
4th	-	-	4 (23.5)
5th	-	3 (5.5%)	3 (17.6%)
6th	5 (14.7%)	18 (32.7%)	5 (29.4%)**
7th	19 (55.9%)*	27 (49.1%)*	1 (5.9%)
8th	8 (23.5%)	6 (10.9%)	2 (11.8%)
9th	2 (5.9%)	-	-
10th	-	1(1.8%)	-
Total	34 (100%)	55 (100%)	17 (100%)

*Peak age at 7th decade – Cap and BPH

** Peak age at 6th decade – urethral stricture

Table 2: Frequency of Causes of BOO

Diagnosis	Frequency	Percentage	Valid Percentage	Cumulative Percentage
CAP	34	32.70	32.70	32.70
BPH	55	51.90	51.90	84.60
URETHRAL STRICTURE	17	15.40	15.40	100.0
Total	104	100.0	100.0	

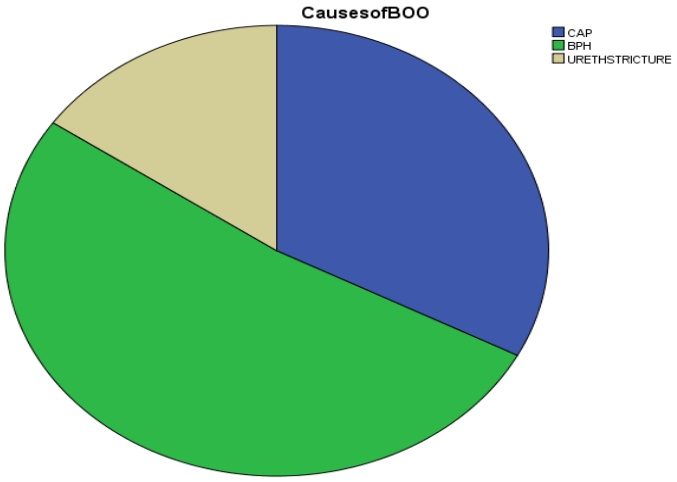

Fig 1: **Pie Chart**: **Causes Of Bladder Outlet Obstruction**

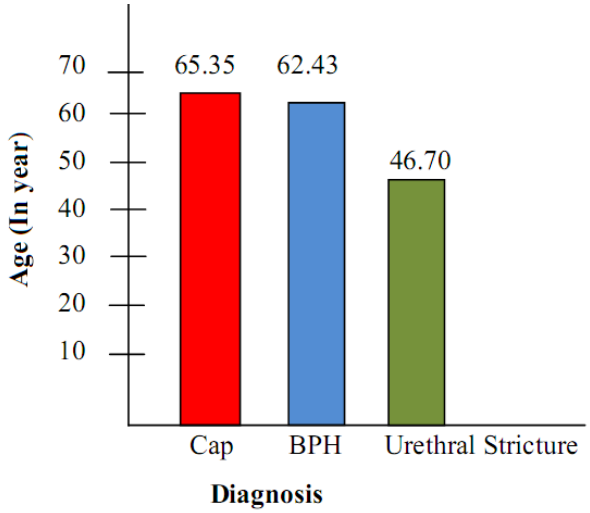

Fig 2: Mean age at Diagnosis

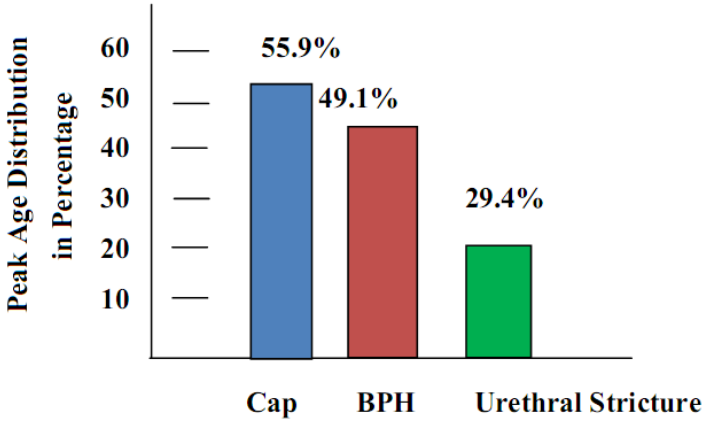

Fig 3: Peak Age Distribution

Table 3: Association between Age of respondents and causes of Bladder Outlet Obstruction:

Characteristics Age groups (years)	**Causes of Bladder Outlet Obstruction**			**Test statistics and values**
	CAP n (%)	BPH n (%)	Urethral Stricture n (%)	
Less than 50 Above 50	0(0.0) 33 (100.0)	1(1.9) 51 (98.1)	7(38.9) 11 (61.1)	X2= 29.595 DF = 2 P = 0.000**

There is a statistically significant relationship between age of respondents and the causes of bladder outlet obstruction. **P=0.000

DISCUSSION:

Bladder outlet obstruction (BOO) is frequently a urologic problem of the ageing male population. It is characterized by difficulty in emptying of the bladder content of urine and usually manifests as lower urinary tract symptoms (LUTS). LUTS may be either obstructive or irritative or both in nature. The causes of BOO are varied and may be due to a neoplastic process, post traumatic, post inflammatory and others like bladder or urethral stones. Still other causes could be neurologic and drug induced.

In our study, the various causes of BOO were principally Cancer of the prostate, benign prostatic hyperplasia and Urethral stricture. Other studies also noted that Cap, BPH and Urethral stricture are virtually the leading causes of BOO [9, 10]. Other causes were not encountered. Relevant assessment modalities directed at diagnosis were a detailed history, physical examination including digital rectal examination (DRE) of the prostate, a prostate specific antigen (PSA), Abdominopelvic Ultrasound Scan, Trans-rectal Ultrasound Scan combined with a prostate biopsy for those with abnormal prostate finding on DRE and a raised PSA > l0ng/ml. The later modality of assessment was purpose-driven to differentially diagnose Cap and rule out BPH. Urethral stricture was diagnosed with a

Retrograde Urethocystogram (RUCG) and a Micturating Cystourethrogram (MCUG).

BPH was the commonest cause of BOO in this study. The relative frequency was 51.9% (55/104 patients). Mbibu *et al* in their review of outpatient clinic attendance in patients with lower urinary tract obstruction also factored BPH as the most common cause with a valid percentage of 54. Similar result was also obtained in the same study at Nnamdi Azikiwe Hospital, Nnewi, Nigeria [11].

Treatment of BPH consisted of prior assessment of symptom severity with the use of International Prostate symptom score (IPSS). All patients had moderate (8-19) to severe (>19-35) symptoms score which warranted treatments. They were placed on α-adrenergic antagonist (Tamsulosin), and a 5 α-reductase inhibitor (Finesteride) was carefully added to those with a prostate volume > 50ml. It has been shown that this combination therapy may decrease incidence of acute urinary retention (AUR) in men at risk [12]. Those with failed medical treatment (those who had AUR while on treatment) and other indications for surgery such as recurrent haematuria, bladder stone(s), bladder diverticulum, recurrent urinary tract infection (UTI) and upper tract abnormalities including hydroureternephrosis were subjected to open prostatectomy. Transurethral resection of the prostate (TURP) is the gold standard for BPH Surgery [13] and this procedure has recently been started in our centre making open surgery a less frequent treatment option except in larger prostate volumes > 75mls where open surgery is advised to reduce complications of TURP [14].

Cap ranked second among the causes of BOO in our centre with a relative frequency of 32.7% (34/104). Ogunbiyi *et al.;* [15] in their review of prostate diseases in Nigeria also reported a prevalence of Cap to be lower than that of BPH with 11% against 25% respectively. Treatment of Cap consisted of combining the Gleason Score of prostate histology of each patient with imaging studies such as Chest X-Ray, Lumbosacral and Pelvic X-Rays to stage the disease into localized, locally advanced and metastatic. Patients were counselled on the available modalities of treatment namely; Antiandrogen therapy (AT) (eg Flutamide), Androgen deprivation therapy (ADT) which included medical orchidectomy with Goserelin as monthly or 3-monthly depot and surgical orchidectomy. For localized disease, treatment is aimed at cure [16] with radical prostatectomy or radical Radiotherapy, but with the paucity of these facilities, in our centre, all patients benefited from AT and ADT.

Comparatively, Urethral Stricture was the least common cause of BOO in our Study with a relative frequency of 15.4% (16/104). Treatment option was based on the location, length and the co-morbid condition of the patients as follows: Penile Urethral stricture < 1cm was attempted with bouginage for non-obliterative strictures, and substitution urethroplasty for obliterative ones. Strictures > 1cm was treated with substitution urethroplasty using skin flap such as described by Orandi [17]. Bulbar Urethral strictures were treated with resection and end-to-end anastomotic urethroplasty for lengths of 1-3cm. Santucci *et al.;* [18] however, used this procedure for stricture lengths of 1-2cm. Substitution Urethroplasty was reserved for those longer than 3cm. Barbagli *et al.;* [19] also adopted this principle. Posterior Urethral strictures especially for those that involved the membranous urethra were treated with bouginage to avoid damage to the external sphincter [20] and risk urinary incontinence with surgical repair.

From this study, it is evident that the mean age at diagnosis is higher in patients with Cap than with BPH while Urethral stricture patients are much younger. In a study of impact of age at diagnosis of Cap, Seth *et al.;* [3] also noted a mean standard deviation age in their cohort as 66.2+8.6 years and a median age of 66 years. This is comparable to that found in our study.

Cap is the most common malignancy in older men [21] and it is estimated that the incidence will continue to rise in men older than 65 years[3]. This has also been observed in our study where majority of the men were above 65 years (70%). However, men in their 9^{th} decade were few which could be due to cancer related deaths or deaths from other co-morbid conditions reducing the chances of presenting for care. BPH, just like Cap, the incidence also rises with age. Autopsy studies have observed a steady rise from 8% to 80% at 4^{th} to 9^{th} decade of life respectively [22]. In our study, there was a steady increase from the 5^{th} to a peak at the 7^{th} decade and a decline thereafter which may also be blamed on increasing causes of age – related deaths from this and other co-morbidities. Urethral stricture is a common urological condition affecting male population who are relatively younger than those with Cap and BPH. In our study, the mean age at diagnosis was 46.70 (SD±14.63) comparable with another study by Cheryl Guttman Krader[8] who observed a mean age at diagnosis for urethral stricture of 49 years. The incidence peaked at the 6^{th} decade of life which also compared with results from Western population by Massimo et al [23] who noted a sharp rise after 55 years of age. Bladder or urethral stone as a cause of BOO was not encountered in our study. These stones where present, may be either a consequence of BOO where urinary stasis could lead to super-saturation and crystallization of solutes resulting in stone formation or a cause by directly lodging at the internal urethral meatus or beyond causing urethral obstruction.

Association between age of respondents and causes of bladder outlet obstruction was also looked at.

It was found that there was a statistically significant relationship between age of respondents and the causes of bladder outlet obstruction (Table 3).

CONCLUSION:

The most common cause of BOO in adult males in our study is BPH followed by Cap and then urethral stricture. This fact is also observed in other studies. Other causes of BOO were not encountered. The mean age at diagnosis was higher in Cap patients than in BPH while urethral structured patients were relatively younger. The above findings also compare with other studies worldwide.

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