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Research Paper

Urinary Tract Infections Seen in Men with Bladder Outlet Obstruction: A Single Centre Retrospective Study in Aba, South Eastern Nigeria.

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ABSTRACT
Urinary tract infections are a common occurrence in the urinary tract. The incidence increases in the presence of predisposing factors such as bladder outlet obstruction (BOO) where there is stasis of urine leaving behind a reservoir in the bladder which acts as a breeding medium enhancing bacterial growth and multiplication.
This incidence of bladder outlet obstruction is higher in the elderly age group. In this age group, declining host immunity coupled with increased co morbidities are two factors influencing the high incidence of urinary tract infections (UTI) in men with BOO.
Additionally, with BOO some men are exposed to indwelling catheterization.
Catheters are foreign bodies and act as niddus for bacterial growth and multiplication.
The mere presence of bacterial in the urine does not indicate UTI because of contamination but significant bacterial count is more or equal to 100,000 organisms per ml of urine.
This was a retrospective study carried out to review men who had bladder outlet obstruction from January 2024 to December 2025 to ascertain the pattern of microbial flora seen in them.
A total of 242 men were managed for BOO in this study period.
136 of them had UTI giving an infection rate of 56.2%.
Out of the 136, the most common organism isolated was Escherichia coli species 52 (38.2%) closely followed by staphylococcus species 41 (30.1%).
The age group 71-80 was the most afflicted with 76 cases (31.4%).
The most common cause of BOO was found to be Benign prostate hyperplasis (BPH) with 95 cases (39.3%) closely followed by prostate cancer with 90 cases (37.2%).
Hypertension and Diabetes mellitus constituted the majority of co morbidities seen in these patients.
91 out of the 136 patients with UTI had catheter placements giving a catheter rate of 66.9%.
This study is significant in knowing the common uropathogens in men with lower urinary tract obstruction as a guide to Antibiotic choice and therapy.

KEY WORDS: *Urinary tract infections, Bladder outlet obstruction, Urinary stasis, Catheter placement and Aba.*

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I. INTRODUCTION

Organisms causing UTI could be endogenous through the peri-urethral route or colonization from host gastrointestinal tract flora or could be exogenous like cross contamination.
Ascent along the urethra allows the bacteria access into the bladder.
Stasis of urine in the bladder as seen in men with obstructed lower urinary tract causes urine reservoir in the bladder which acts as a medium for bacterial growth and multiplication.
Clinically, urinary tract infections (UTI) are categorized into

- Uncomplicated UTI
- Complicated UTI

Uncomplicated UTI occurs in healthy people with no structural or neurologic urinary tract abnormalities and are differentiated into:

- Lower tract – cystitis
- Upper tract – pyelonephritis

Complicated UTIs are infections complicated by factors that compromise the structure of the urinary tract or the host defence.
These include:

- Urinary tract obstruction
- Urinary retention due to neurologic causes
- Immunosuppression
- Renal failure
- Transplantation
- Pregnancy
- Presence of foreign bodies such as catheter
- Calculus

Urinary tract infections are caused by both gram negative and gram positive bacteria and certain fungi.
The most common bacteria for both complicated and uncomplicated UTI include:

- Uropathogenic Escherichia coli
- Klebsiella species
- Staphylococcus species
- Proteus species
- Pseudomonas species
- Group B streptococci
- Enterococcus faecalis

The incidence and virulence of the infection depends on:

- Bacterial virulence
- State of host immunity

Bacterial virulence depends on:

- O antigen
- K antigen
- Capacity for adherence due to the possession of fimbriae called Pili that are responsible for tissue adherence.
- Alpha haemolysin
- Cytotoxic necrotizing factor

The interplay between bacterial virulence and inate host defence mechanism triggers a neutrophil mediated inflammatory response.
Recurrent UTI is said to occur when two or more culture confirmed infections occur within 6 months or 3 or more infections occur within a year with the infections separated by periods when the patient is completely culture free.
Recurrent UTI is further classified into:

- Re-infection
- Relapse

Re-infection suggests a distinct infection caused by a different strain of bacteria or the same strain appearing more than two weeks after the previous infection.

Relapse suggests the occurrence of an infection with the same pathogen shortly after the initial treatment usually within 14 days.
On the other hand, persistent UTI suggests a long term illness where the host immune system cannot completely clear the pathogens.

II. METHODOLOGY

This was a retrospective study spanning two years from January 2024 to December 2025.
The hospital register was used to trace and identify cases of men with bladder outlet obstruction within the study period.
Their hospital folders were retrieved and relevant information obtained from them such as:

- Age
- Diagnosis
- Causes of BOO
- Results of culture tests
- Sensitivity results
- Period of treatment
- Associated co morbidities
- Catheter placement
- Route of placement of catheter

These information were collated, analyzed and interpreted.

INCLUSION CRITERIA
All men who had bladder outlet obstruction within the study period who were managed and discharged were part of this study.

EXCLUSION CRITERIA
All men who had bladder outlet obstruction within the study period but did not consent to management were excluded from this study.

III. RESULTS

TABLE ONE - SHOWING THE ISOLATED UROPATHOGENS

S/N	YEAR	NO. OF MEN WITH BOO	E - COLI	STAPHY LOCCOUS	KLEB SIELLA	PSEUDO MONAS	PROTEUS	TOTAL
1	2024	115	22	19	12	6	5	64
2	2025	127	30	22	13	4	3	72
	TOTAL	242	52	41	25	10	8	136
	PERCEN TAGE OF INFEC TION		38.2%	30.1%	18.4%	7.4%	5.9%	

TABLE 2 – SHOWING DEMOGRAPHIC VARIABLES

S/N	VARIABLE	OUTCOME
1	MEAN AGE IN YEARS	
2	RANGE IN YEARS	38-92 YEARS

TABLE 3 – SHOWING THE AGE GROUP DISTRIBUTION OF MEN WITH BOO

S/N	AGE GROUP IN YEARS	NUMBER	PERCENTAGE
1	30 – 40	10	4.1%
2	41 – 50	24	9.9%
3	51 – 60	49	20.2%
4	61 – 70	53	21.9%
5	71 – 80	76	31.4%
6	81 – 90	22	9.1%
7	91 – 100	8	3.3%
	TOTAL	**242**	**100%**

TABLE 4 – SHOWING THE AETIOLOGY OF BOO

S/N	AETIOLOGY	NUMBER	PERCENTAGE
1	BENIGN PROSTATE HYPERPLASIA	95	39.3%
2	PROSTATE CANCER	90	37.2%
3	URETHRAL STRICTURE	30	12.3%
4	NEUROGENIC BLADDER	14	5.8%
5	BLADDER CANCER	7	2.8%
6	BLADDER NECK HYPERTROPHY	6	2.5%
	TOTAL	**242**	**100%**

FIG – 1 HISTOGRAM

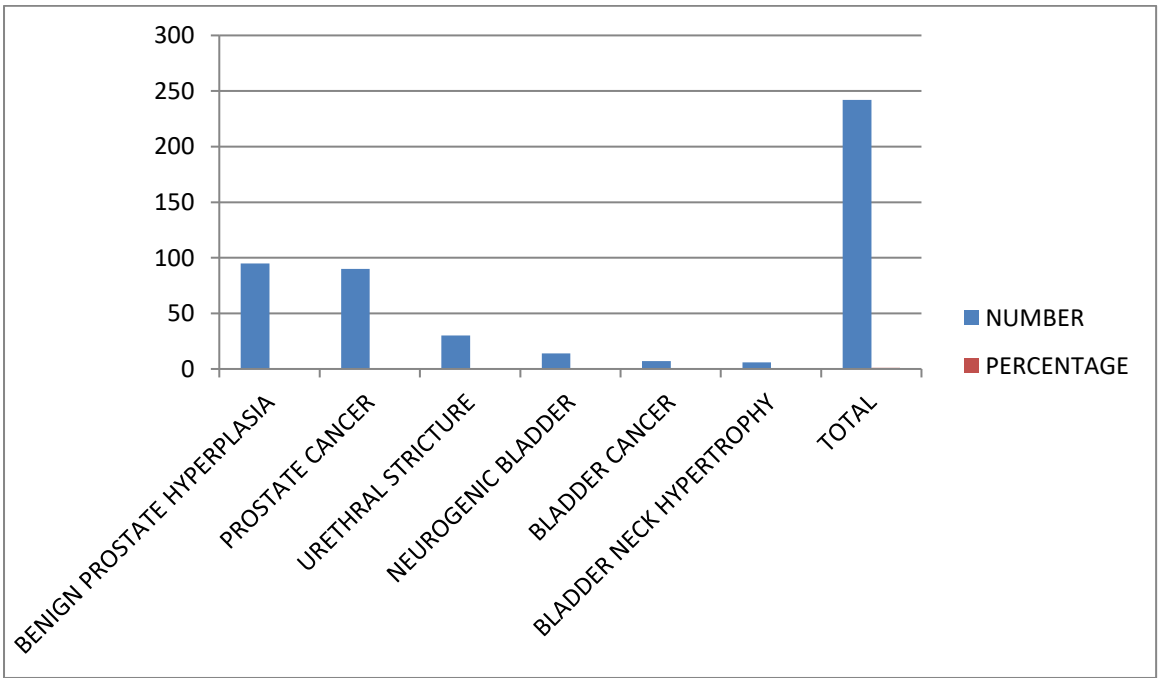


TABLE 5 – SHOWING THE PATTERN OF CO – MORBIDITIES AMONG MEN WITH UTI

S/N	CO- MORBIDITY	NUMBER	PERCENTAGE
1	NIL	35	25.7%
2	HYPERTENSION ALONE	34	25%
3	DIABETES ALONE	28	20.6%
4	HYPERTENSION + DIABETES COMBINED	24	17.6%
5	IMPAIRED RENAL FUNCTION	15	11%
6	TOTAL	136	100%

FIG 2 – HISTOGRAM

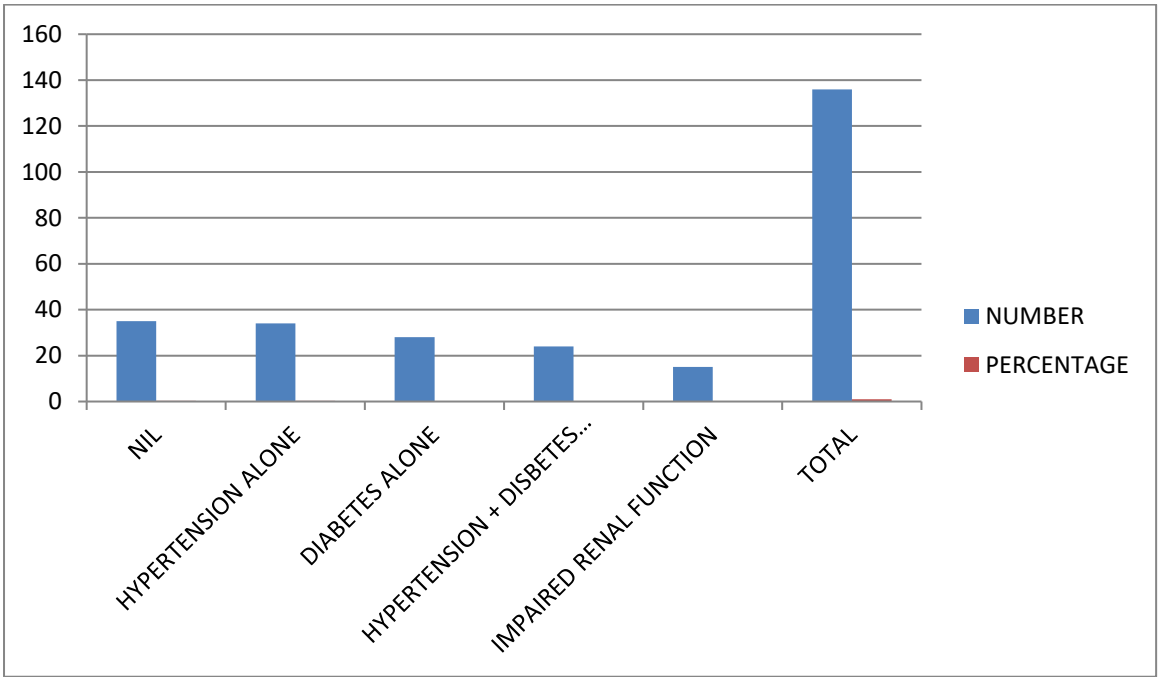
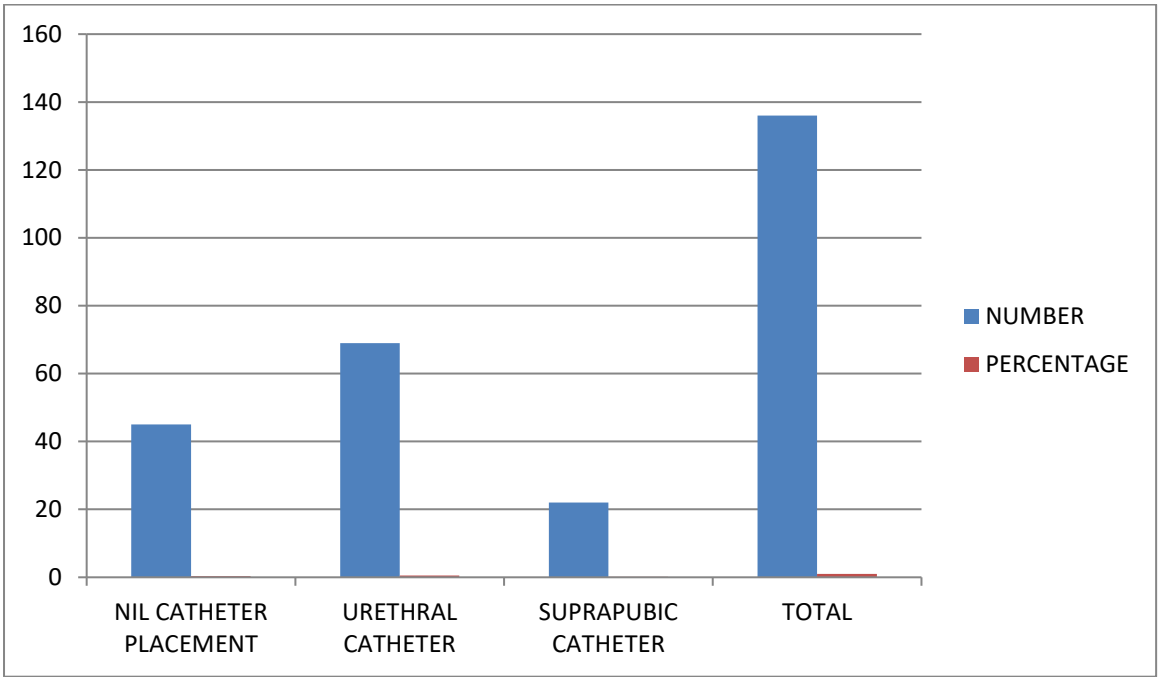


TABLE 6 – SHOWING THE PATTERN OF CATHETER PLACEMENT AMONG MEN WITH UTI

S/N	CATHETER PLACEMENT	NUMBER	PERCENTAGE
1	NIL CATHETER PLACEMENT	45	33%
2	URETHRAL CATHETER	69	50.7%
3	SUPRAPUBIC CATHETER	22	16.2%
4	TOTAL	136	100%

TOTAL CATHETER USE OF (66.9%)

FIG 3 – HISTOGRAM



IV. DISCUSSION

Urinary tract infection (UTI) is common in men with obstructed lower urinary tract. This is because of stasis of urine secondary to obstruction which acts as a reservoir for bacterial growth and multiplication.
In many previous works, the most common uropathogen isolated was Escherichia coli.
In our work, we found the same pattern.
The most common uropathogen isolated was Escherichia coli 38.2% but this was closely followed by staphylococcus species 30.1% quite ahead of klebsiella with 18.4%.
On the whole, a greater proportion of isolates were gram negative bacteria.
We had an infection rate of 56.2%.
As with most previous works, the most common cause of lower urinary tract obstruction was BPH with 39.3% closely followed by prostate cancer with 37.2%.
The most common co-morbidity was hypertension closely followed by Diabetes mellitus.
We had a catheter rate of 66.9%.
According to Asafo-Adjei et al in their work on urinary tract infections among bladder outlet obstruction patients in Accra Ghana, the rate of infection was 35.6% and Benign prostate hyperplasia was the most common cause of lower urinary tract obstruction 78%.

In a previous work by Gyasi-Sarpong et al in their work at Anokye Teaching Hospital Kumasi, Ghana, they found the most common uropathogens as E-coli 51.5%, klebsiella 22.3%, staphylococcus 14.6%, Pseudomonas 7.8% with proteus 2%.
M. Ellias, in his work found an infection rate of 76.6% much higher than what we had in our study.
According to him, the most common uropathogens isolated were the Enterobacteriacae with E-Coli as the most common 33.3%.
He concluded that, catheterization is a major independent predictor of UTI in patients with BOO.
The other predisposing factors included incomplete bladder emptying and residual urine stasis.
He also noted that bacteria isolates in BOO exhibit alarming multidrug resistance.
This was corroborated by another work done by Shakya et al which found BPH as the leading cause of BOO and found the most common uropathogen to be Escherichia coli followed by klebsiella species.
They also found residual urine acting as breeding medium for bacteria and catheterization as major risk factors.
Interestingly, a previous work by O. Omali et al on UTI among female students of University of Agriculture Makurdi, Nigeria found that out of 213 students, staphylococcus was isolated in 120 students (56.34%), streptococcus pyogenes in 18 (8.45%), and E-coli in 60 students (28.17%), Klebsiella 36 (16.9%) and proteus 33 (15.9%).
However, this work was done on uncomplicated UTI with no obstruction of the lower urinary tract.

V. CONCLUSION

The incidence of urinary tract infection in men with bladder outlet obstruction is high.
Majority of the bacterial isolates are gram negative organisms with E-coli leading but staphylococcus species are also dominant.
Every attempt must be made to have a definitive culture and sensitivity result in cases of BOO.
But where culture is not possible, a broad antibiotic spectrum covering both gram negative and gram positive organisms should be instituted.

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