Original Article

Urinary Tract Infection in Symptomatic Benign Prostate Enlargement: Prevalence, Bacteria profile and Antibiotic susceptibility

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ABSTRACT

The clinical morbidity of urinary tract infection on a background of surgical disease is enormous. This may include urosepsis, renal scarring and renal failure. This does not exclude the financial burden that may be incurred in the management of these cases. Therefore, determining the epidemiological pattern of this clinical condition is invaluable to medical practices in our environment. Our objective was to investigate the prevalence, bacterial profile and antibiotic susceptibility pattern of urinary tract infection in symptomatic benign prostate enlargement This was a hospital based retrospective observational study that was conducted over a period of one year. The case notes of patients that were managed for benign prostate enlargement between July 2024 and June 2025 were retrieved from medical record department of our institution. The information extracted from the case note includes age of the patients, urine microscopy, culture and sensitivity including method of urine sample collection at presentation, history of antibiotic intake and urethral catheterization prior presentation, previous history of urinary tract infection and previous history of urethral instrumentation. Patients with benign prostate enlargement with complete urine m/c/s results were recruited into the study while patients with previous history of UTI, history of antibiotic intake and on an indwelling urethral catheter at presentation were excluded from the study. Prevalence, bacterial profile and antibiotic susceptibility were determined. Out of the number of patients that were managed for symptomatic benign prostate enlargement over the period of review, a total of 46 patients fulfilled the recruitment criteria and they were recruited into the study. The age distribution of the study group showed a range of 43-88 years with mean of 62.5+/ 129sd. The period prevalence of urinary sepsis in this study was 47.8%. Six species of micro-organism were cultured and the most common was Escherichia coli (8, 36.3). Culture sensitivity pattern was done against some antibiotics. The most common sensitive antibiotics were imipenem (9, 40.9%), amikacin (8, 36.3%) Ciprofloxacillin (6, 27.2%) and Nitrofurantoin (7, 31.8%)The prevalence of urinary tract infection in BPH patients in our environment was 47.8% and the most commonly involved bacteria was Escherichia coli with imipenem being the most commonly sensitive antibiotic.

Keywords: Bacterial Profile , Prevalance, Urinary Tract Infection

INTRODUCTION

Urinary tract infection is a common clinical condition of the urinary tract. It may manifest as cystitis or urethro-cystitis and pyelonephritis. Patients with urethro –cystitis may present with lower urinary tract symptoms predominantly storage symptoms mimicking symptomatic benign prostate enlargement.1 Urinary tract infection apart from

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being a differential to be considered in patients with lower urinary tract symptoms may also complicate benign prostate enlargement. Patients with symptomatic prostate enlargement often have a history of incomplete bladder emptying. The residual urine left in the bladder may constitute a nidus for bacterial translocation and proliferation and subsequently development of urinary tract infection.2

Urinary tract infection is classified into complicated and uncomplicated type.3 Complicated UTI is usually defined when it occurs in association with a structural or functional abnormality of the genitourinary tract such as benign prostate enlargement. '4The European Association of Urology Classification system for UTI known as ORENUC is based on clinical presentation of the patient with UTI and the patients host factors.5 The incidence of UTI varies according to population. It is seen more commonly in women. Some of other risk factors to exclude in a suspected case of UTI apart from benign prostate enlargement include previous UTI, diabetes mellitus, multiple sexual activities, family history, and uncircumcised phallus among others.

Diagnosis of UTI is made following clinical and laboratory evaluation of suspicious cases.6 Patients with urinary tract infection on a background of benign prostate enlargement may present with worsening symptoms of dysuria, frequency urgency and urge incontinence. Laboratory confirmation is made following urinalysis and urine culture and sensitivity.7 Patients with suspected complicated type may require imaging investigation to unravel the background structural abnormality.

The clinical morbidity of urinary tract infection on a background of surgical disease is enormous. This may include urosepsis, renal scarring and renal failure.8 This does not exclude the financial burden that may be incurred in the management of these cases. Therefore, determining the epidemiological pattern of this clinical condition is invaluable to medical practices in our environment. Our objective was to investigate the prevalence, bacterial profile and antibiotic susceptibility pattern of urinary tract infection in symptomatic benign prostate enlargement.

MATERIALS AND METHODS

This was a hospital based retrospective observational study that was conducted over a period of one year. The case notes of patients that were managed for benign prostate enlargement between July 2024 and June 2025 were retrieved from medical record department of our institution. The information extracted from the case note includes age of the patients, urine microscopy, culture and sensitivity including method of urine sample collection at presentation, history of antibiotic intake and urethral catheterization prior presentation, previous history of urinary tract infection and previous history of urethral instrumentation.The method of isolation of organism as well as method of antibiotic sensitivity was uniform for all the recruited patients. This involved serial dilution.innoculation and incubation. Antibiotics sensitivity test was performed using Kirby-Bauer disc diffusion method. Patients with benign prostate enlargement with complete urine mcs results were recruited into the study while patients with previous history of UTI, history of antibiotic intake and on an indwelling urethral catheter at presentation were excluded from the study. Prevalence, bacterial profile and antibiotic susceptibility were determined.

RESULTS

Out of the number of patients that were managed for symptomatic benign prostate enlargement over the period of review, a total of 46 patients fulfilled the recruitment criteria and they were recruited into the study. The age distribution of the study group showed a range of 43-88 years with mean of 62.5+/ 129sd. The period prevalence of UTI in this study was 47.8%. Six species of micro-organism were cultured and the most common was *Escherichia coli* (8, 36.3) others were *Klebsiella acrogenes*, *Pseudomonas euriginosa*, *Staph. aureus*, K*lebsiella pneumoniae* and *Klebsiella oxytoca.* (Table 1).

Culture sensitivity pattern was done against some antibiotics. This included. Imipenem, amikacin, augmentin, cefuroxime, ceftrixone, genetamicin, nitrofuratoin, ciprofloxacin, ciprofloxacillin,

aztreonam and entrapenam. The most commonly active antibiotics were imipenem (9, 40.9%), amikacin (8, 36.3) ciprofloxacillin (6, 27.2%) and nitrofurantoin (7, 31.8%). (Table 2).

Table 1. Micro-organisms cultured among the study group

Organism	Frequency n=22	Percentage
Escherichia coli	8	36.3
Klebsiella aerogenes	6	27.2
Pseudomonas aeuru ginosa	1	4.5
Staphylococcus aureus	2	9.1
Klebsiella pneumoniae	1	4.5
Klebsiella oxytoca	4	18.1

Table 2. Antibiotic sensitivity pattern among the study group

S/N	Antibiotics	Frequency n =40	percentage
1	Imipenem	9	22.5
2	Amikacin	8	20 .0
3	Augmentin	4	10 .0
4	Cefuroxime	5	12.5
5	Ceftrixone	2	5 .0
6	Gentimicin	2	5 .0
7	Nitrofurantoin	1	2.5
8	Ciprofloxacillin	6	15
9	Levofloxacillin	0	0 .0
10	Ertapenem	2	5 .0
11	Aztreonam	1	2.5

DISCUSSION

The epidemiological pattern of urinary tract infections depends on the severity of the clinical condition as well as socio-geographical pattern of patients affected.9 The epidemiology in complicated is different from uncomplicated type. The period prevalence of urinary tract infection in symptomatic BPH patients as observed in this study (47.8 %) was in agreement with other similar study in the same setting.10 Similar finding was equally reported in Tanzania concerning prevalence of UTI in benign prostatic hyperplasia.11

Age distribution of patients with urinary tract infection on a background of BPH is usually between 5th to 6th decades of life. This was not unexpected as the average age of occurrence of BPH is within this age range.12 This study has further reaffirmed this fact. Although this study was not set out to determine the risk factor for the development of BPH it could however be further established that increasing age may be a risk factor for BPH.

Bacteria is the most common cause of urinary tract infection although fungi infection in the urinary tract has been reported however, it remains a rarity13. It was discovered from this series that *Escherichia coli* was the most common bacterium involved in patients with positive culture. This was in consonance with several other similar studies. The preponderance of *Escherichia coli* is not seen in only complicated UTI but also uncomplicated type14. Similar findings have been reported in both genders. It has been suggested that factors such as anatomical location of the organism in the gastrointestinal tract, special uropthogenic strains of the organism as well as specific adhesins are responsible for this preponderance compared to other microorganism .

Antibiotics sensitivity pattern against uropathogens is dependent on certain factors. These include host and virulence factors. Others such as spectrum of the antibiotics, and environment may also play a role. Broad spectrum antibiotics as the name implies have wider coverage compared to narrow spectrum. Imipenem, a broad spectrum antibiotic was noted to be the most commonly sensitive antibiotics in this study. This is in contrast to other similar study that has reported other than imipenem as the most common.15 This may be as a result of dissimilarity in the type and number of antibiotic being tested. It is also known that variation in the prevalence of pathogenic organism involved may also determine antibiotic susceptibility.

The outcome of this study showed that urinary tract infection is highly prevalent in symptomatic benign prostate enlargement in our environment. Although this study was not set out to determine the attendant factors responsible for this outcome, however it may not be unconnecected to poor health care seeking behavior as well as subsequent delayed presentation

that have been well reported in our environment.15

Limitation

This was a retrospective study and thus prone to recall bias

CONCLUSION

The prevalence of urinary tract infection in BPH patients in our environment was 47.8% and the most commonly involved bacterium was *Escherichia coli* with imipenem being the most commonly active antibiotic.

Recommendation

Considering the likely complication of urinary tract infection such as urosepsis, pyonephrosis among others, patients with clinical suspicion of urinary infection may be empirically commenced on one or more of the sensitive antibiotics as noted in this study. This may reduce the risk of these complications.

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