*International Journal of Clinical Oncology and Cancer Research*
2026, Vol. 11, No. 1, pp. 22–31
https://doi.org/10.11648/j.ijcocr.20261101.13

Research Article

# Bowel Preparation Plus Antibiotic Prophylaxis Versus Antibiotic Prophylaxis Alone for Transrectal Prostate Biopsy: A Comparative Study

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## Abstract

Introduction: Prostate cancer is a common malignancy affecting men beyond middle age. In developed countries, the life time risk of developing microscopic prostate cancer in men is 30%. Prostate cancer is a slow-growing tumor and the risk of developing clinical disease is 16% with 3% lifetime risk of dying from the disease. Prostate biopsy serves as a means for obtaining specimen for cancer diagnosis. The procedure though relatively simple and safe may result in complications hence the need to take some precautions during patient preparation. There is wide variability in the workup protocol amongst urologist with no consensus. The aim of this study was to compare bowel preparation plus antibiotic prophylaxis versus antibiotic prophylaxis alone in reducing the infectious complications following transrectal prostate biopsy. Methodology: Patients who met the inclusion criteria were randomized into two groups. Group I had bowel preparation and antibiotic prophylaxis while group II received antibiotic prophylaxis only. Both groups were followed up and assessed for complications. Data were collected and analyzed using SPSS Version 20. Data were presented using tables and figures and p-value of $< 0.05$ was considered statistically significant. Results: A total of 106 men were recruited for the study. Subjects were randomized into two groups. Group I had 54 subjects while group II had 52 subjects. Age range was 48-96 years with a mean age of 65.4±10.4 years. Both groups had comparable socio-demographic and clinical characteristics. Overall Infective complication in this study was seen in 72 (67.9%). Incidence of significant complication requiring hospitalization was seen in 5 (4.7%). For group I infective complication was seen in 28 (51.8%) while for group II 47 (90.2%) patients had infective complications ($p = 0.009$). The incidence of significant complications requiring hospitalization was 2 (3.7%) for group I and 3 (5.8%) for group II ($p = 0.675$). Conclusion: Overall there is statistically significant difference between the use of bowel preparation plus antibiotic prophylaxis versus antibiotic prophylaxis alone in reducing the infective complication following transrectal prostate biopsy.

## Keywords

Prostate, Cancer, Biopsy, Transrectal, Antibiotics, Infections

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**Received:** 9 January 2026; **Accepted:** 19 January 2026; **Published:** 2 February 2026

# 1. Introduction

In most developed and developing countries prostate cancer is the most commonly diagnosed malignancy affecting men beyond the middle age. [1] In Nigeria, the mean age of patients with prostate cancer is 68.3 ±9.4 years with a hospital incidence of 127/100,000 cases. [2] In western countries, life time risk of developing subclinical cancer in men is 30% but because it is slow-growing, clinical disease risk decreases to 16% and the lifetime risk of dying from the disease is 3%. [3] Prostate cancer is rare before 50 years but after this age there is a steady increase in its incidence. [1].

Prostate biopsy plays a key role in prostate sampling for cancer detection and it is one of the most common urological procedures in Nigeria. [4-7] The procedure is relatively simple, rapid and safe with low morbidity. [8] Generally the complications are mild but precautions should be taken during patient preparation in order to avoid more serious complications. Infective complications following prostate biopsy can be severe and increases the rate of hospitalization. [8] Various preparation protocols are aimed at reducing the incidence of these infective complications. These infectious complications ranges from bacteruria, bacteremia, urinary tract infection (UTI), prostatitis, epididymoorchitis and the more severe cases of sepsis. [8-11, 31].

In this study infectious complications will be defined as post-operative fever/hypothermia, bacteruria, UTI, acute epididymoorchitis and acute prostatitis and the place of bowel preparation plus antibiotic prophylaxis to reduce the infective complications following prostate biopsy was evaluated in this study.

## 1.1. Statement of Research Problems

Prostate cancer incidence is on the increase and definitive diagnosis can only be made by examination of the histological pattern from prostatic tissue obtained at prostate biopsy. [4] It is a common day case urological procedure with minimal complications. [6] Despite the already published guidelines on some common practices in urology, there is lack of standardization of prostate biopsy procedure amongst urologist with different types of preparation protocols adopted by different institutions. [9] Preparations prior to prostate biopsy can be in the form of dietary restrictions alone, use of suppositories, cleansing rectal enemas, antibiotics alone or in combination with one other form of preparation. The aim of any form of bowel preparation is to reduce the fecal load in the rectum which will invariably reduce the infectious complication rate and make the procedure safer.

## 1.2. Justification for the Study

Transrectal prostate biopsy for histological diagnosis is the gold standard for confirming prostate cancer. [6] Infections following prostate biopsy are more likely to require admission to the intensive care unit compared with other complications. [10] Loeb S et al found that the 30 day hospitalization rate after prostate biopsy rose from 1.0% in 1996 to 4.1% in 2005 and 72% of the patients were admitted due to sepsis. [11].

Currently, many urologists use prophylactic antibiotic therapy to minimize the infectious complication after prostate biopsy but these therapies do not completely eliminate the incidence of infection. [12, 13] Even with antimicrobial prophylaxis, infections complicating prostate biopsy are increasing over time and are the most common reason for hospitalization after prostate biopsy. [11] This rising rate of infectious complications following prostate biopsy may appears to reflect the high prevalence of antibiotic resistant strains of enterobacteriaceae. Agbugui et al reported infectious complications in up to 17.2% of prostate biopsies despite antibiotic prophylaxis. [14] For this reason, various strategies have been explored, including bowel preparation as a cleansing technique before prostate biopsy to further reduce infectious complication. [15, 16] While the effect of a bowel preparation before biopsy has not yet been validated it appears technically and scientifically worthwhile as it will invariably reduce the fecal load in the rectum with minimal soilage. To avoid fecal soilage of the operation field and urinary tract infection administration of enema before biopsy is commonly observed. The value of enema before prostate biopsy in reducing infections is however debatable. [17, 18] However, it seems logical that a cleansing enema with an empty rectal vault may reduce bacterial seeding into the prostate. [19].

Furthermore, there is a wide variability in the patient preparations and protocols for prostate biopsy. [20] While the available verifiable studies are foreign with paucity of local studies, it has become increasingly necessary at this time to provide evidence-based standardization in the practice of prostate biopsy amongst urologist especially in tropical Africa.

# 2. Methodology

This was a prospective comparative study over a period of one year during which patients seen at the urology division of our facility with indications for prostate biopsy were recruited for the study. Approval for the study was gotten from the hospital ethics committee and informed consent obtained from the patients before enrollment in the study. Structured profomas were used to obtain the relevant information.

## 2.1. Inclusion Criteria

1) All consenting patients.
2) All patients with suspected prostate cancer who are fit for prostate biopsy.

## 2.2. Exclusion Criteria

1) Refusal to participate in the study.

2) Patients already on systemic antibiotics for another illness within one week of the procedure.
3) Patients with painful anorectal conditions.
4) Immunosuppressed patients.
5) Uncontrolled diabetes mellitus.
6) Known Hypersensitivity to the antibiotic agents.

## 2.3. Pre-operative Assessment/ Procedures

Patients who have met the inclusion criteria and were scheduled for prostate biopsy were assigned by simple random sampling into two groups. This entails each patient picking either group I or group II from a bag containing the pre-labelled groups. Group I, underwent bowel preparation and Group II did not. The two groups were evaluated clinically via the history taking, physical examination and relevant laboratory investigations including pack cell volume (PCV), urinalysis, fasting blood sugar and serum electrolytes, urea and creatinine. Both groups were required to observe a preoperative overnight fast.

## 2.4. Bowel Preparation Procedure

Group I patients, in addition to the preoperative overnight fast, were instructed and taught to self-administer bowel preparation using 10mg bisacodyl rectal suppository on the night (at 8 p.m.) on the day before the prostate biopsy as well as on the morning (at 6 a.m.) of the procedure to empty the rectum.

## 2.5. Morning of Biopsy and Intra-operative Procedures

A pre-biopsy sample for urine culture was taken on the morning of the biopsy from all the patients. Using a digital thermometer the baseline temperature measurement from the axilla was done just before the biopsy procedure. Then both groups received pre-biopsy antibiotic prophylaxis using IV Levofloxacin 500mg and IV Metronidazole 500mg administered at one hour before the procedure to achieve the maximal inhibitory concentration within the prostatic tissue at the time of biopsy.

## 2.6. Prostate Biopsy Procedure

All patients had digitally guided transrectal prostate biopsy as a day case. The authors performed all the biopsies. With the patient initially positioned prone, cleaning of the low back region was done and caudal block anesthesia administered using 20mls of 1% plain xylocain. The patient was then placed in the left lateral position with the right leg flexed at the hip and knee and the left leg extended. Cleaning and draping of the perineum was done. An initial rectal examination was done in all the patients. For those in Group I, the adequacy of bowel preparation was assessed by visual inspection and the absence of palpable fecal matter in the rectum. A patient in Group I was excluded because he was discovered to have a full rectum (failed bowel preparation) during the procedure. An 18G Gallini high-speed core cut spring-loaded trucut biopsy needle was then introduced with the aid of the gloved left index finger. Under digital guidance, biopsy was done in all the patients. A total number of six cores were taken from the lateral portions of the prostate (apex, middle and base portions): three on each side of the midline respectively. An anal pack was inserted after the procedure and the patient instructed to remove it at home at the time of defecation or 6 hours post biopsy if no defecation. All patients were given oral tramadol 50mg twice daily for 4 days as analgesic to be taken at home. Another temperature measurement and immediate post-biopsy urine sample for culture were taken in all the patients. All patients and their care-givers had re-education on the possible early complications like fever, acute urinary retention, persistent hematuria, rectal bleeding and were instructed to report back to the hospital if any of such complication was noticed. They (patients and care-givers) were also educated on using a digital clinical thermometer and followed up via telephone calls, thrice daily (at 6 a.m., 2 p.m. and 10 p.m.) to record the body temperature from the axilla, until post-operative day 3 and to keep a temperature chart at home.

These thermometers were provided at no cost to the patients. All patients or their caregivers were provided with a list of telephone numbers (author's telephone numbers) to call in case of an emergency. They were instructed to come back for a follow up on day 4 and on day 30 after biopsy for assessment of the infective complications. They were allowed to go home after observation for about an hour following the biopsy. However, the focus of this study was on the infective complications and these were assessed as outlined below.

## 2.7. Follow up and Assessment for Infective Complications

At the follow up visit on day 4, clinical and laboratory evaluation to assess for potential infective complications were done for all patients and the data recorded using the structured profoma. Infective complications were classified as post-operative fever without sepsis, hypothermia especially in the elderly, urinary tract infection, bacteriuria, acute prostatitis and epididymoorchitis. All patients were questioned concerning potential infective complications. History of fever, new onset or worsening LUTS, suprapubic pain or flank pain, perineal pain, testicular pain and swelling. Also a complete general and systemic examination was done.

1) Post-Operative fever/ hypothermia: The temperature chart kept by the patients or care givers at home was reviewed at the day 4 follow up visit. Full blood count and blood culture (where necessary) was done for every patient with post-operative fever and appropriate management instituted. A temperature rise of ≥38 degree celsius on two consecutive days or a single rise in temperature > 39 degree celsius in any of the post-operative period was

considered to be post-operative fever.

2) Bacteriuria: The results of the urine samples for microscopy culture and sensitivity taken immediately before and after the prostate biopsy were reviewed. Also another urine sample was taken on the day 4 clinic follow up visit and the results reviewed at the next clinic visit at day 30. The various samples were compared to determine the presence and level of bacteriuria.
3) Urinary tract infection: This was defined as, patients with symptoms like; fever (38°C), suprapubic or costovertebral angle pain/tenderness, frequency, urgency, dysuria and positive urine samples with bacteriuria of ≥ 105 organisms/ml in patients without catheter and bacteriuria of ≥ 103 cfu/ml of ≥1 bacterial species in a single catheter urine specimen or in a midstream voided urine specimen from a patient whose urethral, suprapubic, or condom catheter has been removed within the previous 48 hours. [27]
4) Acute prostatitis; Acute prostatitis was defined as new onset or worsening lower tract urinary symptoms, in the presence of a tender prostate and /or positive culture from a urine sample.[2].
5) Acute epididymoorchitis: Acute epididymoorchitis was diagnosed when testicular swelling and tenderness was obtained with or without a positive urine culture or urethral swab culture. [22] Furthermore, all patients were instructed to come for the day 30 follow up visit. This allowed for the assessment of the already enumerated infective complications which may not have been obvious at the day 4 clinic visit. In this study, post-biopsy fever, bacteriuria, urinary tract infection, acute epididymoorchitis and acute prostatitis were regarded as indicators for infective complications after prostate biopsy.

## 2.8. Sample Size

The sample size was calculated using the Fisher formula 122 n = Z2pq /D2 Where: n = sample size z = standard normal deviation which is 1.96 (at 95% confidence interval). P = The hospital prevalence of prostate cancer in Nigeria, which is approximately 12.7%2 Q=1-P D = precision q = 1-p = 1 - 0.127 =0.873 D = precision = 10%= 0.1 44 n = (1.96)2 x (0.127x 0.873) / (0.1)2. n = (3.8416) x (0.1108) / (0.01). n = 0.4256/0.01 = 42.

Assuming an attrition rate of 10% Then 10% of 42 = 4.2 Hence N is 42+4.2 =46.2. For each group. Thus each group will have equal numbers of 46 participants.

## 2.9. Data Analysis

Completed profomas were pooled and data therein collated. Proportions, means and standard deviation were obtained. Collated data were analyzed using SPSS version 20.0 and p-values less than 0.05 was considered to be statistically significant. Chi square test was used for inferential analysis where appropriate.

## 2.10. Ethical Consideration

Ethical approval for the study was obtained from the hospital health research and ethics committee. Patients were counseled by the author on the purpose and nature of the study and a written informed consent obtained from them willingly and freely. Only consenting patients were enrolled. Subjects were at liberty to opt out of the study at any stage without any consequence in terms of care or treatment.

# 3. Results

## 3.1. The Subjects Enrolled

A total of 106 men made up the two groups were studied. Group I had 54 subjects, while group II had 52 subjects. Majority had tertiary level of education as in Figure 1.

The age range was 48 to 96 years with the mean age as 65.4 ± 10.4 years as in Table 1.

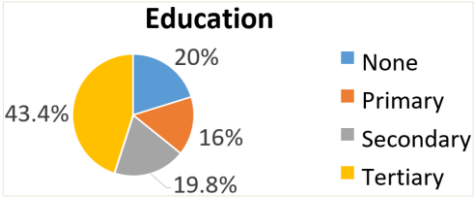


***Figure 1.*** *Level of Education for 106 subjects.*

***Table 1.*** *Age distribution of 106 subjects who had prostate biopsy.*

| Age group | Number | Percentage |
|---|---|---|
| ≤50 | 3 | 2.8 |
| 51-60 | 19 | 17.9 |
| 61-70 | 42 | 39.6 |
| 71-80 | 36 | 34 |
| >80 | 6 | 5.7 |
| Total | 106 | 100.0 |

## 3.2. Mode of Presentation

The predominant presentation was LUTS in 58 (54.7%) of 106 subjects, followed by a combination of LUTS with features of metastatic disease (bone pain, weight loss, hematuria, paraparesis) in 42(39.6%), only one (0.9%) patient presented with bone pain alone. Five (4.7%) subjects were asymptomatic as in Figure 2.

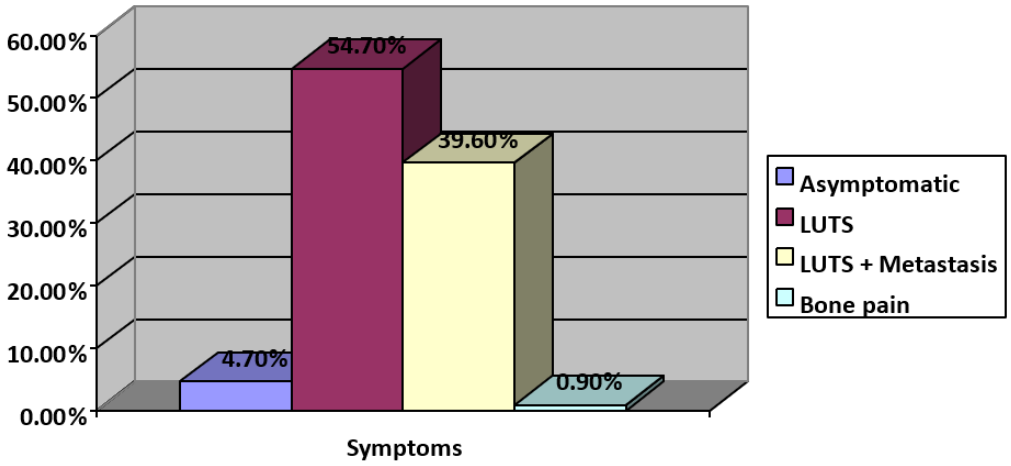


*Figure 2. Mode of Presentation of 106 subjects.*

## 3.3. Comorbidities and Presence of an Indwelling Catheter

Two (3.7%) of 54 subjects in group I and 2(3.8%) of 52 subjects in group II had diabetes mellitus. Hypertension was observed in 14 (25.9%) of 54 subjects and 25(48.0%) of 52 subjects in group II. Seven (12.9%) subjects in group I compared to 3(5.7%) subjects in group II had both diabetes and hypertension. While 19(35.2%) subjects in group I and 16(30.8%) subjects in group II had indwelling urethral catheter, (p = 0.12) as shown in Figure 3.

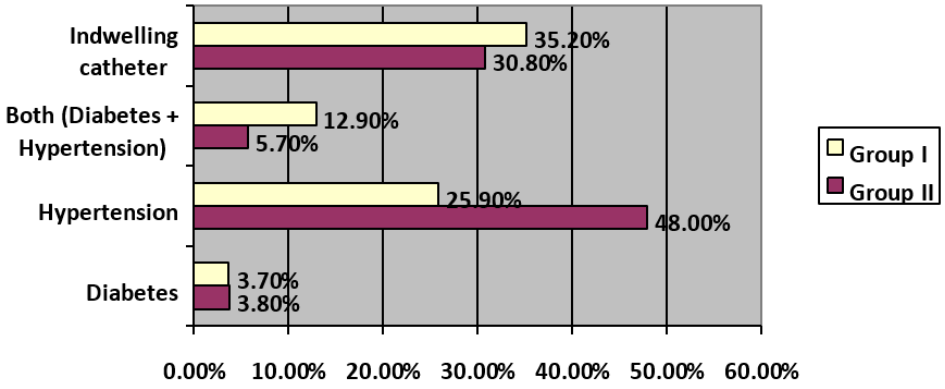


*Figure 3. Comorbidities and the presence of indwelling catheter in group I (N=54) and group II (N=52) subjects.*

## 3.4. Incidence of Infective Complications in the Two Groups of Subjects

Infective complications assessed here were post-operative fever, bacteriuria, urinary tract infection, acute epididymoorchitis and acute prostatitis. There were a total of 75 infective complications in 72 patients while 34 patients had no complication giving an overall complication rate of 67.9% as shown in Table 2. These complications occurred in 28(51.8%) patients in group 1 and in 47 (90.2%) patients in group II (p=0.009).

*Table 2. Incidence of infective complications in group I and group II.*

| Variable | Group I N (%) | Group II N (%) | Total N (%) | P value |
|---|---|---|---|---|
| Infective Complications | | | | |
| Post-Operative fever | 5(9.2) | 7(13.4) | 12(11.3) | 0.56 |
| Bacteriuria | 11(20.4) | 19(36.5) | 30(28.3) | 0.14 |
| UTI | 6(11.1) | 12(23.1) | 18(16.9) | 0.16 |

| Variable | Group I N (%) | Group II N (%) | Total N (%) | P value |
|---|---|---|---|---|
| Acute Epididy-moorchitis | 4(7.4) | 4(7.6) | 8(7.5) | 1.00 |
| Acute Prostatitis | 2(3.7) | 5(9.6) | 7(6.6) | 0.26 |
| Total | 28(51.8) | 47(90.2) | 75(70.7) | |

Post-operative fever occurred in 12 (11.3%) patients. Five (9.2%) and seven (13.4%) of the subjects were in groups I and II respectively (p=0.56). Bacteriuria occurred in 30(36.5%) patients. Eleven (20.4%) of these were in patients in group I, while 19 (36.5%) were recorded in group II (p=0.14). UTI was recorded in 6(11.1%) of subjects in group I and 12(23.1%) in group II with an overall UTI rate of 18(16.9%) of 106 subjects (p= 0.157). The complication rate of acute epididymoorchitis was 8(7.5%) with 4(7.4%) in group I and 4(7.6%) in group II (p=1.00). Acute prostatitis was observed in 2(3.7%) subjects in group I and five (9.6%) in group II with an overall acute prostatitis rate of 7(6.6%) (p=0.257).

Furthermore it was noted that some patients had more than one complications as shown in Figure 4.

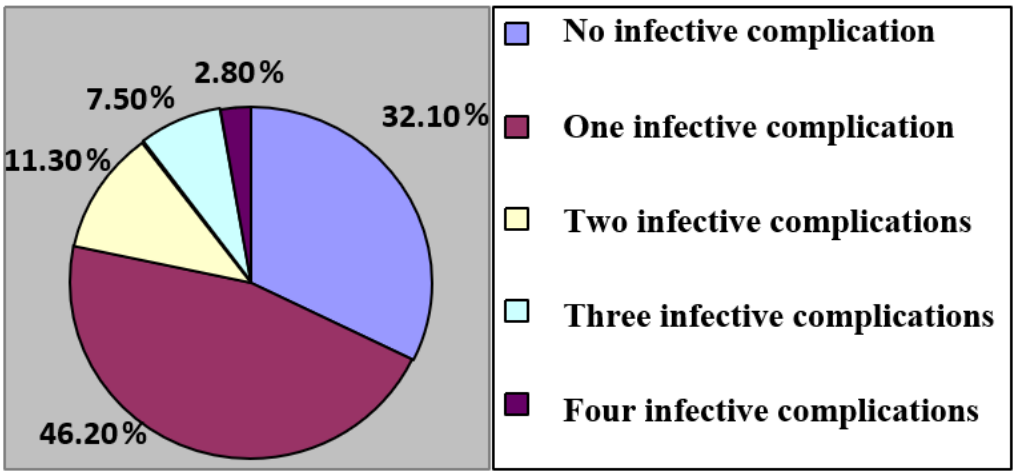


*Figure 4. Frequency of the infective complications in 106 subjects.*

Out of 106 subjects, 34 (32.1%) had no infective complication, (46.2%) had a single infective complication and 12 (11.3%) had two infective complications. Eight (7.5%) and 3(2.8%) subjects had 3 and 4 infective complications respectively.

### 3.5. Significant Bacteriuria in Group I and Group II Subjects

The incidence of significant bacteriuria preoperatively, immediate post-operatively and at day 4 in the two groups with p values of 0.344, 0.857 and 0.065 respectively are shown in Table 3.

*Table 3. Incidence of significant bacteriuria in group I and group II subjects.*

| Variable | GroupI N (%) | Group II N (%) | $\chi 2$ | p |
|---|---|---|---|---|
| Bacteria count Preoperative | | | | |
| Significant bacteriuria | 11(20.4) | 7(13.5) | 0.897 | 0.344 |
| Bacteria count Postoperative | | | | |
| Significant bacteriuria | 9(16.7) | 8(15.4) | 0.032 | 0.857 |
| Bacteria count Day 4 | | | | |
| Significant bacteriuria | 11(20.4) | 19(36.5) | | 0.065 |

### 3.6. Hospital Admission

The rate of hospitalization was 2(3.7%) for subjects in group I and 3(5.8%) for group II (p= 0.675) as shown in the Table 4.

***Table 4.*** *Hospital Admission due to complications for group I and group II patients.*

| Hospital admission | Group I N (%) | Group II N (%) | $X^2$ | P |
|---|---|---|---|---|
| No | 52(96.3) | 49(94.2) | 0.251 | 0.675 |
| Yes | 2(3.7) | 3(5.8) | | |
| Total | 54(100.0) | 52(100.0) | | |

## 4. Discussion

This study determined the value of bowel preparation in addition to antibiotic prophylaxis prior to trans-rectal prostate biopsy.

### 4.1. Age Distribution of the Patients

The mean age for the 106 patients was 65.4 ± 10.4 years. This is similar to the mean age cited in the literature on prostate cancer in Nigeria. [1, 2, 14] The mean age for group one is 68.6 while it is 68.5 for group two (P=0.958).

### 4.2. Mode of Presentation

The most common presentation was lower urinary tract symptoms which was the only presentation in 54.7% of patients. Less than 5% of patients were asymptomatic and the indication for prostate biopsy was elevated PSA. About 40% of the patients had features of metastasis in addition to LUTS. These findings are in keeping with reports from most of the literature in Sub-Saharan Africa where majority of the patients present late with LUTS and metastases suggestive of advanced diseases. [2, 14, 22].

### 4.3. Infective Complications

Prostate biopsy has been a concern recently due to high rate of infectious complications when the procedure is done through the transrectal route without administration of prophylactic antibiotics. [31, 32] This study showed that the overall incidence of infective complications (postoperative fever/hypothermia, bacteriuria, UTI, acute epididymoorchitis, acute prostatitis) following prostate biopsy was 67.9% while the incidence of complications requiring hospital admission was 4.7%. The high incidence of the overall infective complications may be attributed to the fact that patients with known risk factors for infection like indwelling catheters, comorbidities (hypertension, diabetes mellitus) were not excluded from this study unlike in some other studies. [14, 28, 30] Furthermore, the rising antibiotic resistance may be contributory. [4] Also the variability in definitions by different studies make the true incidence difficult to determine. On the other hand when the incidence of complications requiring hospital admission was considered it was found to be similar to that in other studies which reported a range of 0.6 to 6.3%. [4, 16, 21, 23] It is worthy of note that most of the infective complications recorded in this study were not significant and did not require hospital admission. Tsuboi et al observed no significant impact in the prevention of Infectious complications after transrectal prostate biopsy either by rectal disinfection with povidone iodine or the use of antibiotic prophylaxis because the rate of sepsis following the procedure did not significantly reduce. This is similar to our study which observed high rate of infectious complications.

### 4.4. Post-operative Fever/Hypothermia

Hypothermia was not recorded in this study. On the other hand the overall incidence of post-operative fever was 11.3%. Similar findings have been reported in other studies done in sub-Saharan Africa with fever rates of 10%. [14, 25] However other studies outside sub-Saharan Africa reported lower fever rates. Chiang et al reported a fever rate of 6.6% while a study in the United Kingdom reported 5.5% incidence of fever. [16] Those in group I had a fever rate of 9.2%, while the group II patients had a fever rate of 13.4%. The difference in the two groups however were not statistically significant (p=0.56.). Furthermore, in a study where patients had bisacodyl rectal suppository and antibiotic prophylaxis, a fever rate of 2.7-4% was recorded[62] which is lower compared to 9.2% obtained among the group I patients of this index study with similar bowel preparation. [22, 8] Jeon et al in a retrospective comparative study of pre-biopsy enema with bisacodyl rectal suppository plus antibiotic prophylaxis versus antibiotic prophylaxis alone reported a fever rate of 1.3% in the pre-biopsy enema plus antibiotic prophylaxis group and 9.5% in the antibiotic group alone. [29] This difference between the result may be due to the variability in the sample population, selection criteria and the retrospective nature of the study. In this study only 3.7% of patients with post-operative fever in group I required admission while 5.7% of patients in group II required admission for sepsis. These patients were treated as per protocol.

### 4.5. Bacteriuria

In this study the overall incidence of bacteriuria was 28.3% determined on day 4 following prostate biopsy. The incidence of bacteriuria in the literature ranges from 36 to 53% and most were detected within 3 days of the prostate biopsy. [24, 26] In group I, the incidence of bacteriuria was 20.4% while in group

II the incidence was 36.5%. The difference in the two groups was not statistically significant (P=0.144). Lindert et al demonstrated a reduction in bacteraemia and hence bacteriuria from 28% to 4% in patients who had pre-biopsy enema and antibiotic prophylaxis. [28] The higher incidence of bacteriuria recorded in the index study may be attributable to catheter associated asymptomatic bacteriuria in patients on indwelling catheter who were not excluded from this study. The CDC and others however do not recommend routine treatment for bacteriuria. [27]

### 4.6. Urinary Tract Infection

The overall incidence of UTI in this study was 16.9%. Shittu et al reported a UTI rate of 4.3% while Agbugui et al reported a UTI rate of 9.1%. [14, 25] Patients in group I had a lower incidence of UTI (11.1%) compared to group II (23.1%) though the difference was not statistically significant (P=0.157). These figures were higher than those recorded in other studies, possibly due to patient selection criteria with a significant number having comorbidities and were on indwelling catheter. Ruddick et al examined the place of pre-biopsy enema and found a reduction in the UTI rate from 2.11% to 0.46%. [30, 32] The lower incidence of UTI observed by Ruddick et al compared to the 11.1% UTI rate observed for the group I subjects of this study may be due to the variability in the definitions in the two studies. Despite this higher incidence of UTI recorded in the index study, all were treated on outpatient basis without need for hospitalization.

### 4.7. Acute Prostatitis

In this index study the overall rate of acute prostatitis was 6.6%. This is generally not common following prostate biopsy. This is significant compared with other local studies that did not report any incidence. [14, 25] On the other hand 3.7% in group I had acute prostatitis while 9.6% of subjects in group II had acute prostatitis (P=0.257). The finding of 3.7% in group I is similar to another study which reported similar incidence of acute prostatitis. [23].

### 4.8. Acute Epididymoorchitis

Acute epididymoorchitis was observed in 7.5% of patients in this study. This is higher than the rate observed by Chiang et al. [23] The variation may be due to selection criteria which included patient on urethral catheter and comorbid conditons. The incidence of acute epididymoorchitis was similar between group I (7.4%) and group II (7.6%), (p =1.000). The absence of acute epididymoorchitis in most reviewed literature may be explained by the selection criteria and duration of follow up which in this index study was up to one month and hence allowed for these complications to be detected. Patients with Acute epididymoorchitis where placed on antibiotics, analgesic and scrotal elevation with resultant resolution.

Our focus in this study was on infective complications following prostate biopsy. Some non-infective complications were also noted with hematuria being most common. There was no mortality recorded within the 30 day of follow up and most infective complications were managed on outpatient basis.

### 4.9. Conclusion and Recommendations

#### 4.9.1. Conclusion

This study focused at the infective complications between of pre-biopsy bowel preparation with rectal suppository bisacodyl and antibiotic prophylaxis versus antibiotic prophylaxis alone for transrectal prostate biopsy. Overall those in group I despite having higher risk for infective complications had lower incidence of the infective complications following prostate biopsy compared to those in group II.

#### 4.9.2. Recommendations

A prospective multi-center study should be carried out to determine the place of pre-biopsy bowel preparation with rectal bisacodyl in reducing the infective complications following trans-rectal prostate biopsy and possibly compare same with pre-biopsy bowel preparation alone. This will portray a varying perspective in ensuring a reduced complication rate following prostate biopsy.

### 4.10. Limitation of the Study

Due to the day case nature of the procedure, monitoring of temperature for postoperative fever was done at home by the patients and this may have affected the results.

## Abbreviations

| | |
|---|---|
| PSA | Prostate Specific Antigen |
| LUTS | Lower Urinary Tract Symptoms |
| PCV | Pack Cell Volume |
| UTI | Urinary Tract Infection |
| FBS | Fasting Blood Sugar |
| IV | Intravenous |
| TRUS | Transrectal Ultrasound |
| SPSS | Statistical Package for Social Science |

## Funding

This article was funded by the authors.

## Data Availability Statement

All data are in the archive of the hospital record department and readily accessible.

## Conflicts of Interest

The authors declare no conflicts of interest.

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