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Complications Following Prostate Biopsy: A Single Centre Five Year Review

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Abstract: Background: Though prostate biopsy is generally a safe procedure, it can be associated with complications. It is important to document the complication rates and identify potential risk factors for these complications. The aim of this study was therefore to investigate the complication rates following prostate biopsy at the Lagos State University Teaching Hospital Ikeja Lagos Nigeria over a 5 year period from January 2012 to December 2016. Patients and Methods: This was a retrospective study in which the clinical records of all the patients who had prostate biopsy at the Lagos State University Teaching Hospital Ikeja, Lagos Nigeria over a 5 year period between January 2012 and December 2016 were retrieved and analyzed. Results: The clinical records of a total of 258 patients were available for review. The mean age was 68.2years (range 45 to 81years). The mean and median PSA values were 560ng/ml and 57ng/ml respectively (range 2.05 to 15,400ng/ml). The prostate biopsy was transrectal and digitally guided in all cases. All the patients had empirical intravenous prophylactic antibiotics with intravenous ciprofloxacin 500mg stat and were discharged on oral ciprofloxacin 500mg bd and oral metronidazole 400mg tds for one week. All the patients had a caudal block. One hundred and seventeen (45.3%) had a comorbidity. The mean prostate size was 109gms (range 16 – 146gms). The size of the trucut needle used was size 16 in 121 patients (46.9%) and size 18 in 125 patients (48.4%). The mean number of biopsy cores taken was 10 (range 4 to 15). The histological diagnosis was carcinoma of the prostate in 154 patients (59.7%) and benign prostatic hyperplasia in 100 patients (38.8%). Twenty four patients (9.3%) had complications. The complications were sepsis (3.1%), rectal bleeding (2.3%), haematuria (2.3%) and acute urinary retention (1.6%). Thirteen patients needed hospitalization (5%). There was no mortality. The incidence of sepsis was statistically significantly higher with increasing the number of cores taken (p=0.000), but there was no significant difference in the incidence of sepsis with the size of the trucut needle used (p= 0.299) or the presence of morbidity (p = 0.503). Conclusion: Though the complication rates following prostate biopsy remain low, increasing number of prostate cores taken is a risk factor for adverse events. We therefore recommend reducing the number of prostate cores taken in patients with advanced prostate cancer with high tumour volume in order to further reduce the risk of prostate biopsy complications in our environment.

Keywords: Prostate Biopsy, Complications, Sepsis

1. Introduction

Prostate biopsy is one of the most common procedures performed by urologists. This is because prostate cancer remains a leading cancer diagnosis and cause of cancer related deaths amongst men worldwide. Prostate cancer is the most common malignancy in the adult Nigerian male with reports suggesting it accounts for 19.6% of all cancer cases in Nigeria [1, 2].

A prostate biopsy is needed to make a histological diagnosis whenever prostate cancer is suspected following an abnormal digital examination, elevated serum prostate specific antigen (PSA) or both. The prostate biopsy technique

as well as the various indications and results have been widely reported [3, 4]. Though a prostate biopsy is generally a simple and safe procedure with low mortality [4], it is not without possible complications. These complications can range from mild and self-limiting, to severe and potentially life-threatening. Since most prostate biopsies are performed transrectally, infectious complications such as fever, urinary tract infection, epididymoorchitis and sepsis may arise from the introduction of rectal bacteria into the prostate, the urinary tract or bloodstream [5, 6]. The reported non-infectious complications that may arise include haematuria in up to 14.5% of cases and rectal bleeding in up to 2.2% of cases [7]. Other reported complications include haemospermia, perineal pain and acute urinary retention. While some of these complications may persist for up to two weeks, there is usually a progressive decrease in their severity with time. [8]

It is important that these complications be borne in mind whenever patients are being prepared and counselled for prostate biopsy. There are few reports available in Nigeria on prostate biopsy complication rates, thus there are limited local data to guide urologists while taking consent for prostate biopsy. Some of the fears that patients have about prostate biopsy complications may actually be exaggerated. The aim of this study was therefore to investigate the complication rates following prostate biopsy at the Lagos State University Teaching Hospital Ikeja Lagos Nigeria over a 5 year period from January 2012 to December 2016.

2. Patients and Methods

This was a retrospective study in which the clinical records of all the patients who had prostate biopsy at the Lagos State University Teaching Hospital Ikeja, Lagos Nigeria over a 5 year period between January 2012 and December 2016 were retrieved. The data analysed were the age of the patient, serum PSA, prostate size, presence of comorbidity, cadre of the doctor performing the biopsy, antibiotic prophylaxis, type of anaesthesia, size of trucut needle used, number of prostate cores taken, histological diagnosis, presence of complication and mortality. The data were expressed as means and medians, and analysis was by Statistical Package for Social Sciences (SPSS) version 20.0 for windows. We evaluated if the patient's age, presence of comorbidity, trucut needle size and the number of prostate cores taken were risk factors for complications following prostate biopsy. The test for statistical significance was carried out using the Fischer's exact and Chi square test, with a *P* value <0.05 considered significant.

3. Results

The clinical records of a total of 258 patients were available for review. The age distribution of the patients is as shown in Table 1 with a mean age of 68.2years (range 45 to 81years).

Table 1. *Patients' Age Distribution.*

Age (years)	Frequency	Percentage
≤ 50	2	0.8
51 - 60	31	12.0
61 - 70	115	44.6
71 - 80	89	34.5
81 - 0	21	8.1
Total	258	100

The mean and median PSA values were 560ng/ml and 57ng/ml respectively (range 2.05 to 15,400ng/ml). The prostate biopsy was transrectal and digitally guided in all cases. All the patients had empirical intravenous prophylactic antibiotics with intravenous ciprofloxacin 500mg stat and were discharged on oral ciprofloxacin 500mg bd and oral metronidazole 400mg tds for one week. All the patients had a caudal block. One hundred and seventeen (45.3%) had a comorbidity. The commonest comorbidities were hypertension (n = 86, 33.3%), diabetes (n = 9, 3.4%), and patients with both hypertension and diabetes (n = 22, 8.5%). The mean prostate size was 109gms (range 16 – 146gms). Most of the prostate biopsies were done by resident doctors (n= 204, 79.1%) while 20.9% (n=54) were carried out by consultants. The size of the trucut needle used was size 16 in 121 patients (46.9%) and size 18 in 125 patients (48.4%). The needle size was not stated in 12 patients (4.7%). (Figure 1)

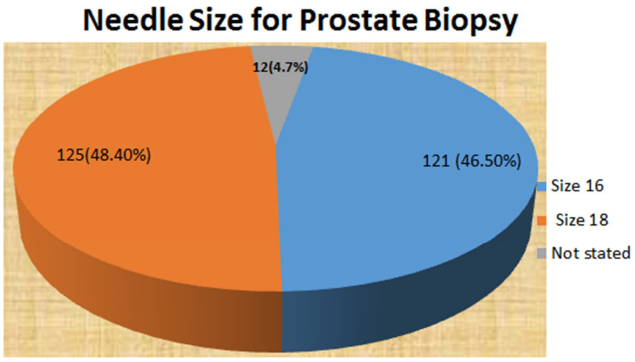

Figure 1. *Needle Size for Prostate Biopsy.*

Most of the patients (n=196, 76%) had between 8 and 12 prostatic cores taken and the mean number of biopsy cores taken was 10 (range 4 to 15). (Figure 2)

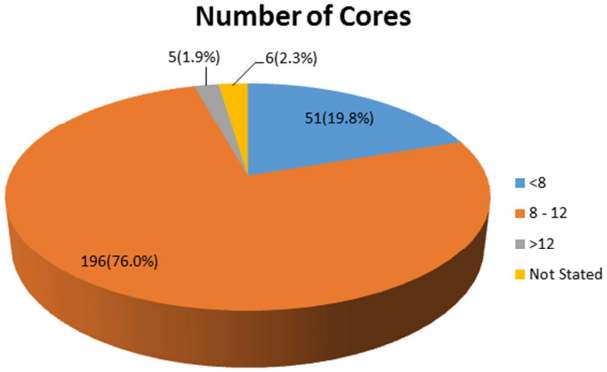

Figure 2. *Number of Cores.*

The histological diagnosis was carcinoma of the prostate in 154 patients (59.7%) and benign prostatic hyperplasia in 100 patients (38.8%). (Table 2)

Table 2. *Histological Diagnosis.*

Diagnosis	Frequency	Percentage
Carcinoma of the Prostate	154	59.7
Benign Prostatic Hyperplasia	100	38.8
Prostatic Intraepithelial Neoplasia	2	0.8
No Histology/Inadequate Specimen	2	0.8
Total	258	100

Twenty four patients (9.3%) had complications. The complications were sepsis (3.1%), rectal bleeding (2.3%), haematuria (2.3%) and acute urinary retention (1.6%). Thirteen patients needed hospitalization (5%). There was no mortality. (Table 3)

Table 3. *Complications following Prostate Biopsy.*

Complication	Frequency	Percentage
No Complication	234	90.7
Rectal Bleeding	6	2.3
Haematuria	6	2.3
Urinary Retention	4	1.6
UTI/Sepsis	8	3.1
Total	258	100

The incidence of sepsis was statistically significantly higher with increasing the number of cores taken (p=0.000), but there was no significant difference in the incidence of sepsis with the size of the trucut needle used (p= 0.299) or the presence of morbidity (p = 0.503). The incidence of rectal bleed correlated negatively with the patients' age (p=0.014).

4. Discussion

Most of the patients in our study presented with high PSA values indicative of advanced disease in keeping with the findings of Badmus et al [9]. Though an ultrasound guided prostate biopsy is the standard method of carrying out a transrectal prostate biopsy [3, 4], lack of ready access to ultrasound in the operating room, clinics and wards means most of the prostate biopsies done in our setting are essentially digitally guided as shown by previous workers [10-12]. The fact that most of our patients also present with advanced disease [9] means the absence of ultrasound guidance may not be a major drawback in this group of patients with advanced disease since the patients already have extensive prostatic involvement by the tumour. Our pick up rate for carcinoma of the prostate of 59.7% ~~%~~ was higher than the 46% reported by Shittu et al [11].

We gave a caudal block as the means of anaesthesia and this was satisfactory for pain control in the majority of the patients. Previous studies have shown caudal block to be an effective means of anaesthesia for minor perineal procedures [13-15].

Our use of ciprofloxacin as prophylaxis is in line with the global recommendation and practice involving the use of a quinolone as the agent of first choice in the prevention of infective complications of prostate biopsy [16].

Our reported incidence of rectal bleeding of 2.3% was similar to the 2.2% reported by Ecke et al but lower than the 5.2% reported by Shittu et al [7, 11]. The incidence of haematuria of 2.3% we found was also less than the reported 5.2% by Shittu et al and 14.5%. by Ecke et al [7, 11]. We averagely used a size 16G or 18G needle for prostate biopsy which is smaller than the 14G reported by Shittu et al [11]. This may have contributed to the less risk of bleeding we found. We however did not find any statistically significant difference in the complication rates between the use of size 16G needle and the use of size 18G needle. A previous work by Cicione et al also did not show the use of size 16 needle to increase prostate biopsy morbidity – over the use of size 18 [17].

The incidence of sepsis (of 3.1%) and hospitalization rate (of 5%) we recorded were higher than the respective rates of 0.1 – 0.5% and 1.6% reported by Chiang et al [18], but our reported incidence of sepsis was similar to the 4.3% reported by Shittu et al [11]. Some conditions have been documented as being risk factors for sepsis and these include mainly urethral catheterization and diabetes mellitus as reported by Lange et al and Simsir et al [19, 20]. We however did not find any significant difference in the complication rates (for bleeding or for sepsis) between the patients who had comorbidities (hypertension, diabetes mellitus) and those without comorbidities (P = 0.503). Though it has been reported that the rates of discomfort and major complications do not depend on the number and site of punctures made with the biopsy needle and that their incidence is not higher in patients submitted to an initial biopsy or rebiopsy after some weeks [21, 22], we did find that the risk of sepsis was significantly higher with increasing the number of prostate cores taken. The plausible reasons for this difference in findings may be due to the more advanced disease in our patients with higher PSA, bigger prostate or the type of prophylactic antibiotic regimen used.

The prescribed number of prostate cores to be taken during a biopsy is generally recommended as 10 to 12 [23]. This helps to improve the chances of getting a positive core especially for patients with limited amount of tumour present. Also the percentage of positive cores may be important in disease stratification, prognostication and treatment planning in patients with early prostate cancer. It however does not appear that this argument or advantage of taking multiple cores holds for patients with advanced disease as is the case for most of the patients in our environment. Most of these patients with advanced disease already have a high tumour burden which can be detected histologically with few prostatic cores. Taking several prostatic cores in patients with advanced disease may not give any additional actionable information beyond the establishment of histological diagnosis.

In the light of our finding of a significantly increased risk of sepsis with increasing number of prostatic cores, we recommend that patients with advanced prostate cancer in our environment need not have multiple prostate cores taken for biopsy as the important information needed in this group of patients is the establishment of a histological diagnosis

which can be achieved sometimes with even a single prostatic core. More studies will be needed to define what should be the ideal number of prostate cores to be taken for this group of patients in order to optimize histological yield on the one hand and minimize the risk of sepsis on the other. The negative correlation of rectal bleeding that we found with age will also require further investigation. Brewster et al had identified advancing age as a risk factor for adverse events following prostate biopsy. [24]

5. Conclusion

Though the complication rates following prostate biopsy remain low, the risk of sepsis is significantly higher with increasing number of prostatic cores in patients with advanced prostate cancer. Considering that most of the patients in our environment with carcinoma of the patient present late with high volume disease, we recommend a protocol of reducing the number of prostate cores taken in this group of patients with advanced prostate cancer with high tumour volume in order to further reduce the risk of prostate biopsy complications.

Conflicts of Interest

The authors declare no conflicts of interest.

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