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Impact of Prostate Needle Biopsy on Erectile Function in Nigerian Men

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Abstract

Background: Prostate biopsy has been described as a procedure without many complications. However, possible effect on erectile function remains controversial. The impact of finger-guided prostate needle biopsies (FGPNB) on erectile dysfunction (ED) was prospectively studied.

Materials and Methods: Seventy-nine men who underwent FGPNB completed the International Index of Erectile Function (IIEF)-5 questionnaires on the day of the biopsy, 1 week, 4 and 12 weeks after. Concomitant ED-related systemic diseases and/or medications that could affect erectile function were excluded.

Results: Age range was 50 years to 98 years with mean age of 67.6 years ± 10.7 years. Highest prevalence of ED was among age group 70 years to 79 years. Severity of ED increased with the increase in post biopsy weeks. The mean IIEF difference was significant at week 1 among the age groups (p=0.029) and between age groups 50 years to 59 years and 70 years to 79 years (p=0.038). Moderate ED (27.9%) and severe ED (27.9%) was prevalent in week 1 and 12 respectively.

Conclusion: Although the prevalence of ED was highest among age group 70-79 years with a significant mean IIEF difference between age group 50 years to 59 years and 70 years to 79 years, ED appeared not to be biopsy related in Nigerian men. However, there was a trend in the increasing severity of ED with post biopsy period.

Keywords: Erectile dysfunction; Finger-guided; Impact; Prostate biopsy

Introduction

Generally, prostate needle biopsy has been described as a procedure with few complications [1].

But some major complications like hematospermia, hematuria, and rectal bleeding have been reported [2-7]. Furthermore, some authors have reported Erectile Dysfunction (ED) in patients, even six months after the biopsy but others have expressed doubt about this report [8]. Several reasons have been adduced for the likelihood of ED development after Prostate needle biopsy.Zisman et al. reported that prostate biopsy-induced ED may occur by direct neurovascular bundle damage or secondary trauma due to nerve compression by a hematoma and/or edema [3], while other authors have proposed that ED associated with prostate needle biopsy may be related to a direct injury to the neurovascular bundles, inflammation, and/or scarring related to the laterally directed biopsies [9,10]In spite of the above reasons, ED has been neglected as a complication worthy of evaluation especially in settings where finger-guided prostate needle biopsy is being practiced.This study was designed to prospectively investigate the impact of finger-guided prostate needle biopsy on ED in Nigerian men undergoing prostate needle biopsy.To the best of our knowledge, this is the first study that has investigated the impact of finger-guided prostate biopsy (FGPNB) on ED in this country.

Materials and Methods

This was a prospective study of patients who had FGPNB in the urology clinic of Ekiti State University Teaching Hospital, Ado-Ekiti from January 2016 to Mach 2017.

A total of 79 patients who underwent prostate needle biopsy due to abnormal digital rectal examination findings and/or elevated blood serum prostate-specific antigen levels (≥ 10 ng/ml which was our practice in this centre) were included in this study. All the patients were either married or had been in a stable relationship with a female sexual partner for at least 12 months. History of previous prostatic biopsy or prostatic surgery, active urinary tract infection, bleeding diathesis, use of 5-α-reductase inhibitors, and/or a blockers, and previous history of diabetes mellitus and hypertension were exclusion criteria.None of the patients was on aspirin or any NSAID less than 7 days before the procedure. The biopsy was done with patient on the left lateral position after 100ml of 200mg of ciprofloxacin was given intravenously. Trucut needle size 14G [Disposable guillotine needle for coaxial soft tissue biopsy with semi-automatic action 14G × 20cm VigeoS-1. Via Dell'Alpino, made in Italy] was used to take the biopsy and the tissue sent for histology in a formalin-contained specimen bottle. The lead author did all the biopsies.

Assessment of erectile function

All the men completed the five-item version of the International Index of Erectile Function [IIEF-5] [11] on the day of the biopsy, one

week after, 4 week and 12 week after. An IIEF-5 score of <22 was considered to indicate that the patient had ED. [11]

IIEF scoring severity

1) No ED, IIEF =22-25

2) Mild ED, IIEF=17-21

3) Mild-to-moderate ED, IIEF=12-16

4) Moderate ED, IIEF=8-11

5) Severe ED, IIEF=5-7

Ethical approval

The Ethical committee of Ekiti State University Teaching Hospital, Ado-Ekiti gave ethical approval before the commencement of this study. All patients gave written informed consent.

Statistical analysis

The data generated was analyzed using the Statistical Package for Social Science (SPSS) version 21. Frequency distribution of the variables was generated. The mean and standard deviation were calculated for continuous variables. Cross tabulations were performed to determine associations for the dependent and independent variables. One way ANOVA was performed to determine difference in mean IIEF at pre-biopsy, weeks 1, 4 and 12 after biopsy. P value ≤ 0.05 was considered statistically significant.

Results

In Table 1 the highest prevalence of ED was among age group 70 years to 79 years. Age range was 50 years to 98 years with mean age of 67.6 years ± 10.7 years (Table 1).

Age group	Pre-biopsy	Week 1	Week 4	Week 12	Prevalence
50-59 years	20	18	20	20	27.80%
60-69 years	20	20	20	20	24.10%
70-79 years	24	24	24	22	29.10%
≥ 80 years	15	15	12	13	19.00%
ANOVA	F	3.18	1.451	1.139	
	P-value	0.029	0.235	0.339	
Age category	Mean diff	PostHOC analysis sig.			
60-69	4.35	0.097			
70-79	4.867	0.038			
≥ 80	4.783	0.088			

Table 1: Frequency of ED by age category using IIEF score <22 and their mean differences.

The only significant difference in the mean IIEF among the age categories was at week 1 (p=0.029). Then, applying post HOC analysis to establish the significance of mean IIEF difference at week 1 between the age group 50 years to 59 years and age groups 60 years to ≥ 80 years showed a statistically significant difference (p=0.038) (Figure 1).

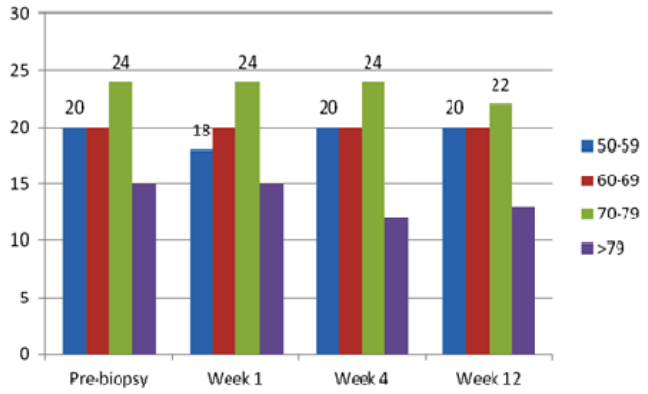

Figure 1: Comparison of frequency of ED among age categories at specified time intervals and it shows that frequency of ED was commonest among age group 70-79 years all through the biopsy period. Green=age group 50-59 years; Red=age group 60-69 years; Blue- age group 70-79; Purple=age group ≥ 80.

Table 2 shows that prevalence of mild ED increased in week 4 and week 12 after the biopsy while mild-to-moderate ED decreased in the same period. However, moderate ED decreased in all the period after biopsy while severe ED increased in week 1 and week 12 only. Mild-moderate ED was the most prevalent in week 1, mild-moderate and severe ED were most prevalent in week 4 and severe ED was the most prevalent in week 12.

IIEF Score Category	Prebiopsy	Week 1	Week 4	Week 12
No ED	0 (0%)	2 (2.5%)	2 (2.5%)	4 (5.1%)
Mild	16 (20.3%)	14 (17.7%)	18 (22.8%)	19 (24.1%)
Mild to moderate	26 (32.9%)	26 (32.9%)	22 (27.9%)	19 (24.1%)
Moderate	17 (21.5)	16 (20.3%)	15 (19%)	15 (19%)
Severe	20 (25.3%)	21 (26.6%)	22 (27.9%)	22 (27.9%)

Table 2: Prevalence of severity of ED among biopsied men according to time of biopsy.

Discussion

We sought to investigate the impact of finger-guided prostate needle biopsy among Nigerian men undergoing prostate biopsy. Prostate biopsy is a common urologic procedure with few complications [1-8].

Our study revealed a prevalence of 100% ED pre-biopsy. This was a very high prevalence when compared to the report of Murray et al. where pre-biopsy prevalence was 61.4% [12]. The difference between these two studies may be attributable to the fact that Murray et al. study was better powered. However, the prevalence of 82.6% by Chrisofos et al. [4] and 81.4% in Brazilian men screened for prostate cancer by Paranhos et al. tended to support the high prevalence of our study [4,13].

Besides, the prevalence of ED was highest among age group 70 years to 79 years (29.1%). This is in conformity with the findings of Corona et al. that investigated ED in men aged 40 years to 79 years and reported a higher prevalence in the old age groups peaking in men 70 years and above [14]. This may be attributable to increasing degrees of atherosclerotic vascular alterations in the arterial bed of the penis in aging men [15].

However, the highest prevalence of ED (29.1%) among age group 70 years to 79 years remained constant from pre-biopsy through week 1, week 4 to week 12 in our study. This is consistent with the findings of Aleksander et al. who reported 30% prevalence in 70 years to 79 years among Crotian men [16]. But it is contrary to the findings of Altung et al. who reported worsening trend in prevalence of ED following TRUSS biopsy over the weeks after the biopsy [17]. This difference may be as a result of non-categorization of the population by Altung et al. Although the fact that Altung used TRUSS while we used finger-guided procedure may be responsible for the differences.

In addition, the mean difference in IIEF was statistically significant at week 1 (p=0.029) among the age groups. When subjected to post HOC analysis, there was a significant difference in IIEF between the age group 50 years to 59 years and 70 years to 79 years. This implies that men in age group 50 years to 59 years tended to have improvement in ED one week following biopsy compared to men in age group 70 years to 79 years. With no clear cut reason readily adducible for this finding, it may not be unrelated to improvement in psychogenic factors associated with ED. This may be due to the impact of anxiety and psychological factors pre-biopsy that probably abated immediately after the procedure [17,18].

Furthermore, while mild-to-moderate ED was the most prevalent in our series prior to biopsy, mild ED was the most prevalent in the study by Murray et al. [4], Chrisofos et al. [12] and Altung et al. [17]. Racial differences and other socio-economic factors may account for these differences. Besides, the associated voiding disorders that may be present in these patients in our study, due to late presentation, might be responsible for the high severity of ED. This is due to the fact that voiding disorder can result into partial obstruction that could elicit increased expression and activity of Rho-kinase, altered expression and bioavailability of nitric acid or nitric oxide synthase in the smooth muscles of cavernous body [18,19].

Furthermore, mild-moderate and severe ED were prevalent in week 4 and severe ED was prevalent in week 12 post biopsy in our study. This is contrary to the findings of Chrisofos et al. that reported mild-to-moderate as the most prevalent forms in both week 4 and 12 post biopsy [4]. Although Chrisofos et al. used TRUS in their work. Nonetheless, this was an indication that the severity of ED tended to be worse in men in our study than elsewhere [4, 12,13]. The reason for this is a subject of future research.

Conclusion

ED in this study may not be biopsy related because the highest prevalence of 29.1% among the age group 70 years to 79 years was recorded both before and after prostate needle biopsy. However, as the duration after the biopsy increased, the severity of ED got worse. Therefore men undergoing finger-guided prostate needle biopsy should be screened for ED and counseled on the possibility of worsening trends of severity of ED after the procedure.

Limitations of the study

1) The power of this study was low with only 79 men participating.

2) Being a Hospital-based study, it may be difficult to extrapolate it to the larger community. Therefore a community based study is recommended.

What this study adds

1) The Prevalence of ED in Nigerian men undergoing prostate biopsy is highest among age group 70 years to 79 years.

2) That finger-guided prostate needle biopsy is not without erectile problems.

3) That Nigerian men have moderate to severe ED after biopsy.

4) That Nigerian men with prostatic diseases have a high prevalence of unreported ED.

5) That men in age group 50 years to 59 years have significantly different mean IIEF than age group 70 years to 79 years one week after biopsy.

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