ORIGINAL ARTICLE

A histopathological study of prostate lesions in Lagos, Nigeria: A private practice experience

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ABSTRACT

Introduction: Prostatic carcinoma (CaP) is globally the second most frequently diagnosed cancer and the sixth leading cause of cancer death in males. The aim of this study is to determine the pattern of histopathological types of prostatic lesions seen in a private laboratory in Lagos, Nigeria. **Materials and Methods:** Histopathological reports of all prostate specimens, which were received and processed by histopathology section of a private laboratory in Lagos, Nigeria, from August 2009 to December 2013 were reviewed. **Results:** A total of 304 prostatic tissue specimens were received and processed during the period under review. The youngest patient was 32 years old while the oldest patient was 99 years old with a mean of 67.8 years ± 9.5. The most common diagnosis was benign prostatic hyperplasia (BPH) (62.8%), distantly followed by CaP (29.3%), inadequate samples (6.6%), prostatic intraepithelial neoplasia (1%), and metastasis to the prostate (0.3%). The peak incidence was age group of 60-69 years, closely followed by 70-79 years accounting for 38.2% and 36.2%, respectively. Moderately differentiated CaP (Gleason scores [GSs] 5-7) accounted for 58.1% of the cases while GS 7 was the most common individual score and was seen in 32.3% of the CaP cases. **Conclusion:** In this private practice, BPH is the most common prostate lesion. CaP is relatively high and most of the cases have a high GS that portends high mortality in our population. Efforts should be made to increase awareness so as to reduce the mortality.

Key words: Benign prostatic hyperplasia, private practice, prostatic carcinoma

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INTRODUCTION

Diseases of the prostate constitute a significant portion of the cases seen by urologists in males and are substantial sources of morbidity and mortality among adult male population worldwide.[1,2] Three pathologic processes mainly affect the prostate gland: Inflammatory (prostatitis), benign prostatic hyperplasia (BPH), and tumors (premalignant and malignant lesions). Of these three, BPH is the most common and occurs so often in an advanced age that they can almost be construed as a "normal" aging process. Prostatic carcinoma (CaP) is also an extremely common lesion in men.[3] Prostatitis may be acute or chronic bacterial prostatitis, chronic abacterial prostatitis, or granulomatous prostatitis.[3] Histologic evidence of BPH can be seen in approximately 20% of men by 40 years of age, a figure that increases to 70% by age 60 and to 90% by age 80.[3] The pathophysiology of BPH remains incompletely understood. The development of the histologic features of BPH is dependent on the bioavailability of testosterone and its metabolite, dihydrotestosterone.[4] Additional risk factors include several modifiable factors involved in metabolic syndromes such as obesity, diabetes, high levels of alcohol consumption, and physical inactivity.[5] Furthermore, race, black (vs. white) is suspected to play a role. The mechanisms underlying these associations remain poorly understood.[5] Globally, BPH affects about 210 million males.[6] Various studies reported the rate of BPH to be in the range

Access this article online

Quick Response Code:

Website: www.nigeriamedj.com

DOI: 10.4103/0300-1652.170388

How to cite this article: Nwafor CC, Keshinro OS, Abudu EK. A histopathological study of prostate lesions in Lagos, Nigeria: A private practice experience. Niger Med J 2015;56:338-43.

of 67.5-87.5% of prostatic lesions and gave a peak age of 6th and 7th decades for those affected.[2,7-14] Studies from Saudi Arabia and India reported the 7th decade while study in Pakistan and all Nigerian studies except that from Benin reported the 6th decade as the peak age group affected.[2,7-14]

CaP is globally the second most frequently diagnosed cancer and the sixth leading cause of cancer death in males.[15] The worldwide incidence of CaP has been rising rapidly, likely due to intensified effort in early detection and screening.[16] It is of such a great magnitude that in the United States, it is postulated that 1 in 6 American men will develop CaP over his lifespan.[17] The incidence of CaP is said to be low in China and some parts of Asia but in Nigeria, CaP has assumed the number one position in male cancers, constituting 11% of all male cancers.[16,18] The major risk factors for CaP are race, age, and family history of prostate cancer.[16] Other suggested but inconclusively agreed risk factors include association with bladder cancer, cigarette smoking, vasectomy, and sexual behavior.[16] CaP rates in various studies were in the range of 12.5-30.9% of prostatic lesions.[2,7-14] All Nigerian studies except the study from Ilorin reported a rate of at least 22.4%.[2,10-13]

All the foreign studies and all the Nigerian studies, but one was hospital-based studies conducted in tertiary health care facilities, which usually serve as referral centers (putting a high selective index on the data from such institutions), however, many Nigerians visit privately owned hospitals for their health needs. These privately operated hospitals usually utilize the services of privately owned laboratories like the setting where this study was done. This research was carried out in a private laboratory in Lagos, Nigeria to study the histopathological types of prostatic lesions seen. We set out to review our data base with respect to prostatic lesions to see the pattern in relation to those from government owned tertiary hospitals and to add to the growing database of prostatic lesions so as to help to combat CaP menace through actions such as health education and screening programs.

MATERIALS AND METHODS

This retrospective study included histopathological reports of all prostate specimens, which were received and processed by histopathology section of Me Cure Health Limited, Lagos, Nigeria (a modern, large privately owned diagnostic establishment), from August 2009 to December 2013. This histopathology section renders services to many privately owned hospitals within Lagos State and few neighboring states. These prostate specimens were received in 10% buffered formalin and processed with auto processors. Paraffin-embedded sections (at 2-3 μm) were routinely stained with hematoxylin and eosin stains. Data were extracted from the establishment computer database entered into an excel sheet and analyzed using predictive analytical software, version 17 (IBM, SPSS Inc., Chicago, IL, USA), with respect to age, frequency, histological types of lesion, and Gleason grading for prostatic adenocarcinomas. The research was approved by a review board of the establishment.

RESULTS

A total of 304 prostatic tissue specimens were received and processed during the 5 years period under review. This accounted for 6.5% of all 4642 specimens processed in the histopathology laboratory. Prostatectomy accounted for 10% of all specimens, while Tru-Cut needle biopsies accounted for 90% of all specimens, as shown in Figure 1. The youngest patient was 32 years while the oldest patient was 99 years with a mean of 67.8 years ± 9.5 standard deviation. The most common diagnosis was BPH (62.8%), distantly followed by CaP (29.3%), inadequate specimens (6.6%), prostatic intraepithelial neoplasia (PIN) (1%), and metastasis to the prostate (0.3%) as shown in Table 1. Of the CaP cases, 97.8% were from Tru-Cut needle biopsy specimens, while 2.2% were from prostatectomy cases (incidental carcinoma). The age group 60-69 years, closely followed by age group 70-79 years accounted for most

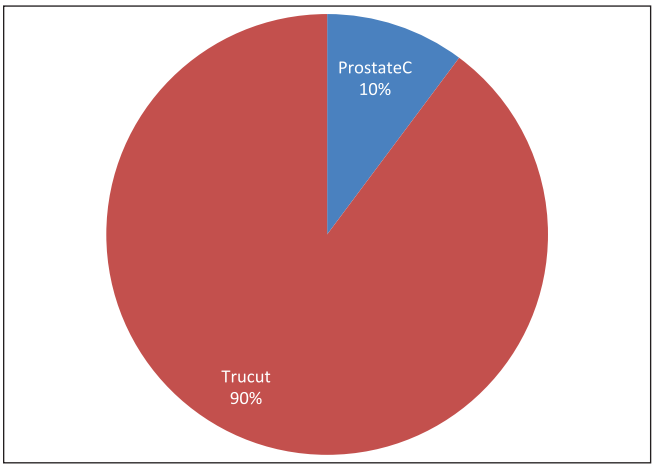

Figure 1: Specimen distribution

Table 1: Histological types of prostatic lesions in relation to age

Age group	BPH	PIN	CaP	Metastasis	Inadequate	Total (%)
30-39	3	—	—	—	—	3 (1)
40-49	6	—	2	—	1	9 (3)
50-59	27	—	8	—	3	38 (12.5)
60-69	70	2	35	1	8	116 (38.2)
70-79	69	1	35	—	5	110 (36.2)
80-89	13	—	9	—	3	25 (8.2)
≥90	3	—	—	—	—	3 (1)
Total	191 (62.8)	3 (1)	89 (29.3)	1 (0.3)	20 (6.6)	304 (100)

BPH – Benign prostatic hyperplasia; PIN – Prostatic intraepithelial neoplasia; CaP – Prostatic carcinoma

lesions (38.2% and 36.2%, respectively). The age groups 30-39 and ≥90 years accounted for the least number of cases (1% each) as shown in Table 1. No case of CaP was seen in age groups 30-39 and ≥90 years age group.

Gleason score (GS) 7 was the most common score and was seen in 32.3% of CaP cases while 17.7% of CaP cases had GS 9 and 14.5% had GS 6. The least score recorded was GS 3, which was seen in 1.6% of cases as shown in Table 2. Moderately, differentiated CaP (GSs 5-7) accounted for 58.1% of cases, while poorly differentiated cases (GSs 8-10) accounted for 33.8% of cases, and well-differentiated cases (GSs 2-4) accounted for the least number of cases (8.1%).

A total of 62 cases of BPH were associated with other histological changes. Of these changes, chronic prostatitis, acute prostatitis, and squamous metaplasia accounted for 82.3%, 16.1%, and 1.6%, respectively.

DISCUSSION

In recent times in Nigeria, there have been a lot of industrial actions by the various unions in the health sector, which has resulted in shutting down of the hospitals for several weeks and at times even months. This has made many Nigerians to utilize the services of privately owned hospitals and health facilities like the facility where this study was carried out in. This study was conducted in Lagos, Nigeria. Lagos State has the highest population in Nigeria, which is over 5% of the national estimate and currently has a population of over 21 million.[19] This high population makes the government owned health sector to be overstretched even when they are working. Because of the above two reasons (frequent industrial actions and high population density), many inhabitants of Lagos State utilize the services of privately owned hospitals and facilities. These privately owned hospitals usually send tissue specimens to privately owned laboratories like ours. Since privately owned establishments are playing a role in citizen's health; hence, there is the need to include information from these privately owned health facilities into the national database.

Specimens of prostate accounted for 6.5% of all histopathological specimens. This rate is higher than 3.2% reported in Jos and 3.6% reported in a previous study from Lagos.[12,14] However, the rate of 6.5% is close to 7.4% reported in Kano.[13] Lagos and Kano are said to be the two most populated states in Nigeria and this may explain the high rates seen in both states, however, this high rate which still may be a tip of an iceberg, implies that awareness must be increased. Studies by Ukoli *et al*.,[20] reported that none of their screened Nigerian population after adequate counseling accepted to go for prostate biopsy due to the following reasons; they men had no symptoms and felt it was a waste of their hard earned money, irrational morbid fear of impotence following procedures around their anorectum, fear of the diagnosis, and the possible complications. Studies by Akhator and Essiet[21] on even symptomatic prostate cancer patients in Nigeria showed that the majority refused biopsy regardless of adequate counseling. The need to increase awareness cannot be over emphasized because of these studies by Wilkinson *et al*. has proven that just an hour dedicated seminar on prostate cancer increased awareness and knowledge from 26% to 73.3%.[22]

Table 2: Frequency of GS in relation to age groups

GS	40-49	50-59	60-69	70-79	80-89	Total (%)
3	—	—	1	—	—	1 (1.6)
4	—	—	1	3	—	4 (6.5)
5	—	1	3	3	—	7 (11.3)
6	1	—	3	4	1	9 (14.5)
7	—	1	7	9	3	20 (32.3)
8	—	2	5	3	1	11 (17.7)
9	—	—	5	4	1	10 (16.1)

GS – Gleason score

The ratio of benign prostatic lesions to CaP is 2.1:1 in this study. This is slightly less than the ratio from the other parts of Nigeria; 2.3:1 in Benin, 2.5:1 in a previous Lagos study, 3:1 in another study from Benin, 3:1 in Jos, and 3.5:1 in Kano but much lower than 4.6:1 reported in Saudi Arabia.[2,7,10,12-14] Studies have shown that CaP incidence in native Asian men is relatively low when compared with other cancer types but is substantially increased in Asians living in Westernized countries.[23] Reasons for the much lower rate of CaP in Asia is not well known though genetic and environmental factors, particularly Western diet, could partially explain these differences, however, lower exposure to prostate-specific antigen (PSA) screening in Asian individuals might be a major contributing factor.[23]

The frequency of BPH and CaP in this study rises steeply through the age groups, peaking at age groups 60-69 and 70-79 years in almost an equal proportion, followed by a sharp descent thereafter, such that no case of CaP was seen in age group 80-90 years and 90 years and above. No other previous study documented this almost equal distribution of BPH and CaP cases between these two age groups and the reason for this cannot be explained. Though all the previous Nigerian studies and study from Pakistan reported the 6th decade as the major age group involved expect studies in Jos, India, and Saudi Arabia, which reported the 7th decade as the most common age group involved.[7-13] No previous Nigerian study observed a high prevalence in the 8th decade and this is an improvement though the reasons for this is not clear. Slight improvement in life expectancy may have played a role. This finding is at variance with findings in Caucasians, where there is a steady progressive rise in the incidence with a peak at the 9th decade of life, in view

of their longer life expectancy and higher standards of living.[24,25]

BPH accounted for 62.8% of all prostatic lesions, and most cases were in the 7th and 8th decade. BPH is characterized pathologically by a cellular proliferation of the epithelial and stromal elements in the prostate gland. These changes begin histologically in the 3rd decade of life and clinically in the 5th decade of life, resulting in increased resistance to urinary flow during micturition.[8] BPH is an important cause of diminished quality of life among aging men, and the prevalence of this condition is likely to grow as the population ages.[26] Clearly, the most important demographic factor in the incidence and severity of BPH is aging.[26]

Chronic prostatitis accounted for the most of the histological changes associated with BPH in the index study. This is similar to findings from other Nigerian and Saudi Arabian studies.[7,10,12,13] In general prostatitis is seen in about 11-98% of prostatic specimens and its diagnosis is dependent on the criteria used by the assessor.[27] Since the major reason for the removal is either BPH or CaP, some pathologist may not emphasis the presence of inflammatory cells except in rare cases such as tuberculosis or schistosomiasis.

High-grade PIN (HGPIN) accounted for 1% of cases. Similar low rates were reported in Jos and India.[8,12] PIN is the most established precursor of CaP. The presence of prominent nucleoli within an existing duct structure is an easy way to identify the disorder.[28,29] Clinical studies suggest that PIN predates carcinoma by 10 years or more, with low-grade PIN first appearing in men in their thirties.[29] The finding of PIN indicates the need for repeat biopsy and follow-up, especially in patients with elevated serum PSA concentration.[29] The clinical significance of HGPIN is that it identifies patients at risk for malignancy.[28] HGPIN and CaP are associated with increased incidence and severity with age, and with high rates of occurrence in the peripheral zone of the prostate. Androgen deprivation therapy decreases the prevalence and extent of PIN, and may play a role in chemoprevention.[28]

CaP accounted for 29.3% of prostatic lesions in the index study. This rate though within the range of 12.5-30% reported by previous studies, however, this rate is higher than the rate reported by most previous Nigerian studies.[10-14] Thus, suggesting that CaP is high in our environment, and efforts at early detection and awareness should be increased. It is common to see breast and cervical cancer campaign in some major cities in Nigeria by nongovernmental organizations, with some occasional free screening and examination, but same cannot be said for CaP. Cap has been known as a disease of elderly men. Diagnosis is rare before age 50, but after this age incidence increases exponentially, and the rate of increase is faster than that seen in other malignancies. The exact role of age in the development of CaP is controversial.[16] Black race is said to be affected more than other races. African and American men develop the disease 50% more frequently than their white counterparts of the same age.[30] When compared with white Americans, they are younger at the time of diagnosis and their tumors are higher in stage and grade.[31] Furthermore, their 5-year survival rate has been reported to be less than that of their white counterparts.[31] The reasons for the higher prostate cancer incidence in black Americans are not known and are probably multifactorial, combining environmental and genetic factors.[16] A study by Osegbe in Nigeria was of the opinion that there must be a common genetic predisposition between American blacks and Africans, particularly Nigerians.[32]

Thirty-two point three percent of the CaP cases had a GS of 7, which was the most frequent score. This is greater than scores from Jos and Benin, similar to scores from Saudi Arabia and Pakistan, but lesser than a score from a previous study in Lagos.[2,7,9,12,14] The Gleason grading system, based on architectural features of prostate cancer cells, is the most widely used histological grading method for prostatic adenocarcinoma. The GS closely correlates with clinical behavior and provides an important index of prognosis.[33] Furthermore, this score is one of the key determinants in treatment decision making, together with stage, age, and PSA.[33] It is the only grading system that recognizes the histologic heterogeneity of tumor present within a single prostate specimen by assigning grades to the primary and secondary patterns and combining this grade into the score (scored as 2-10).[34] Though reproducible, across different institutions, stage, and grade depend on the subjective assessment of the investigator(s).[35] Studies have shown that patients with a pathological GS of ≤6 have an excellent progress-free survival, which can be up to 90%. However, men with a GS ≥7 adenocarcinoma have a 29-43% risk of death from prostate cancer.[36] Since GS is an index of prognosis, we can appreciate why CaP has a high mortality in Nigeria because our men present mainly with GS 7 and above. Lack of awareness of the disease has been implicated as the cause of the high scores.[37]

Inadequate specimens accounted for 6.6% of all prostatic specimens seen. This number is quite high, though other studies did not make mention of these group of prostatic specimens, or they were excluded from the study. The major implication of this group of specimens is that when the results of the histopathologic investigation are out, (in our setting minimum of 3 days), both the surgeon and patient are usually too disappointed. The common histopathologic findings in these circumstances are a lack of prostatic glandular elements (which are keys for histological diagnosis) or in some situations presence of only colonic mucosa. Most prostatic biopsies in our environment,

not ultrasound-guided. Inadequacy of prostatic biopsy specimens are mainly operator dependent and most prominent in apical and far lateral biopsy specimens.[38] To reduce pain and patient time wastage and embarrassment caused to the surgeon, ultrasound-guided biopsy and avoidance of sampling of apical and far lateral sections of the prostate should be encouraged.

CONCLUSION

BPH is the most common prostate lesion. Only a few cases of prostatitis and PIN were documented. CaP is relatively high in Lagos, and most of the cases have a high GS that portends high mortality in our population. This rate may be higher if mass screening is introduced; hence, the efforts should be made to increase awareness so as to reduce the mortality associated with CaP. Surgeons should strive to do ultrasound-guided biopsies so as to reduce time wastage and not to discourage the few patients who accepted to do a biopsy.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

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