

# Histopathological Pattern of Prostate Diseases in Yola, Nigeria: A Five-year Review

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## Abstract

**Background:** This was a five-year retrospective study aimed at analyzing all prostate biopsies submitted to the Department of Pathology, Federal Medical Centre, Yola. It will also serve as a baseline or reference study for subsequent related research in the future. **Materials and Methods:** All cases registered as prostate diseases within the study period were extracted from the departmental records, comprising bench books and histology reports. The age of the patients, histological diagnosis, and specimen types or surgical procedures (core biopsy, transurethral resection of prostate, or prostatectomy) were retrieved as well. All the slides corresponding to the extracted registered prostate cases received in the department between January 2012 and December 2016 were retrieved, then reviewed microscopically and analyzed afterward. **Results:** A total of 634 prostate tissues were submitted for histology during the study period. 63.6% (403) of these specimens were prostatectomy, whereas the remaining were core biopsies. Almost all the cases (436) analyzed occurred in men 40 years and above and predominantly in the 7<sup>th</sup> and 8<sup>th</sup> decades. Nodular hyperplasia was the most prevalent prostatic disease seen over the study period accounting for 542 cases (85.5%). The second in frequency was prostatic adenocarcinoma constituting 14% (89) of the total cases. Two cases of high-grade prostate intraepithelial neoplasia and a case of chronic prostatic inflammation were also seen. **Conclusion:** This study has shown that prostate diseases are most prevalent in the 6<sup>th</sup> through 9<sup>th</sup> decades of life, with nodular hyperplasia being the most common lesion of the prostate.

**Keywords:** Diseases, histopathological, pattern, prostate

## INTRODUCTION

The prostate in the normal adult is a pear-shaped retroperitoneal organ that weighs approximately 20 g<sup>[1,2]</sup> and surrounds the bladder neck and urethra.<sup>[3]</sup> Histologically, it is composed of glands and fibromuscular stroma.<sup>[1,4]</sup> Three pathologic processes affect the prostate gland with significant frequency. These include benign prostatic hyperplasia (BPH), prostatic cancer, and prostatitis.<sup>[1,3,5]</sup> These pathological processes constitute serious morbidity and mortality in adult males worldwide with different incidences in various geographical areas.<sup>[6]</sup>

BPH is the most common urological disorder in males above 40 years of age. Its clinical incidence is 8% in the 4<sup>th</sup> decade, but rises to 50% and 75% in the 5<sup>th</sup> and 8<sup>th</sup> decade of life respectively.<sup>[4,6,7]</sup> Old age and sustained androgen supply are the two major risk factors for its development.<sup>[6]</sup> BPH is not a precursor for prostate cancers, but may be related to those arising in transition zones.<sup>[1]</sup>

Worldwide, prostate cancer is the fifth most prevalent cancer and the second most diagnosed in men. Majority of the cases were seen in developed countries. The highest incidence rates were documented in some parts of America, Western and Northern Europe, as well as Australia/New Zealand (104.2/100,000). This has been attributed to the routine prostate biopsies that follow prostate-specific antigen (PSA) testing.<sup>[8]</sup>

In Sub-Saharan Africa, studies have also shown prostate cancer to be the number one with regard to incidence and mortality especially in black men when compared to other racial groups.<sup>[8]</sup>

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Prostate cancer is the most common cancer affecting Nigerian males but with varying and relatively high incidence rates ranging from 14% to 24.6%.<sup>[9]</sup>

## MATERIALS AND METHODS

All cases registered as prostate diseases within the study period were extracted from the departmental records, comprising bench books and histology reports. The age of the patients, histological diagnosis, and specimen types or surgical procedures (core biopsy, transurethral resection of prostate [TURP], or prostatectomy) were also retrieved from the departmental records. All the slides and tissue blocks of prostate specimens received in the Department of Pathology, Federal Medical Centre, Yola, between January 2012 and December 2016, were included in the study. All histology slides stained with haematoxylin and eosin were retrieved and studied. Fresh sections were made from formalin-fixed, paraffin-embedded stored tissue blocks where slides were missing, broken, or faded. They were then reviewed microscopically.

The cases excluded from the study were those reported as inadequate for histological diagnosis and the ones in which neither slides nor the blocks could be found.

Statistical Program for Social Sciences (SPSS) version-20.0 software (Armonk, NY: IBM Corp) was used for data analysis. The data were presented as simple frequency tables, figures, and photomicrographs.

## RESULTS

A total of six hundred and thirty-four prostate tissues were submitted for histology during the study period. 63.6% (403) of these specimens were prostatectomies, while the remaining were core biopsies [Figure 1]. Almost all the cases (436) analyzed occurred in men 40 years and above and specifically in the 7<sup>th</sup> and 8<sup>th</sup> decades [Table 1]. The spectrum of prostate diseases seen includes nodular hyperplasia, adenocarcinoma, prostate intraepithelial neoplasia (PIN), and prostatitis.

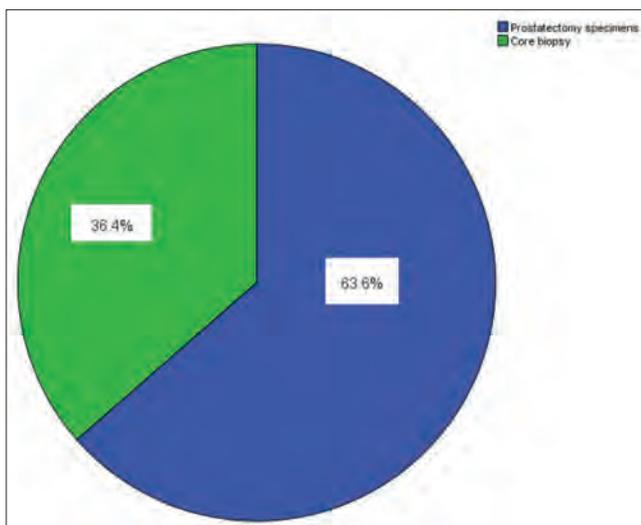


Figure 1: Pie chart showing types of specimens in prostate diseases

Nodular hyperplasia (with or without chronic prostatic inflammation) was the most prevalent prostatic disease seen over the study period accounting for 542 cases (85.5%), with only 41 cases of these being nodular hyperplasia with chronic prostatic inflammation. 37.8% (205 cases) of the nodular hyperplasia were seen in the 7<sup>th</sup> decade, whereas 29.9% (162 cases) occurred a decade later [Table 1].

The second in frequency to the nodular hyperplasia as observed in this study was prostatic adenocarcinoma accounting for 89 (14%) of the total cases. The majority of these cases, 35 (39.3%), were seen in the 8<sup>th</sup> decade, while 32 (36%) other cases occurred a decade earlier (7<sup>th</sup>) [Table 1].

Two cases of high-grade PIN (HGPIN) and a case of chronic prostatic inflammation were also seen [Table 1].

## DISCUSSION

Prostatectomies (63.6%) constituted the most predominant type of prostate specimens submitted for histology during the study period, with the other being core biopsies (36.4%). A similar study in Kano<sup>[10]</sup> showed that all their prostate specimens were either core biopsies or prostatectomies too, but without stating the frequency of each type like our study. In a study of 529 cases reviewed by Obiorah and Nwosu,<sup>[9]</sup> 56.9% were core biopsies, while 43.1% were prostatectomy specimens. These findings contrast our study probably because while Obiorah and Nwosu looked at prostate cancers only, this study encompasses all prostatic diseases ranging from inflammatory to benign to malignant in which treatment for some of these diseases is usually prostatectomy. Studies by Bhatta and Hirachan, Mosli *et al.*, and Satyasri *et al.*<sup>[4,11,12]</sup> showed core biopsies and TURP predominating over prostatectomy in contrast to our findings. This finding may not be unconnected to the lack of expertise or equipment to perform this procedure (TURP) during the study period in our center.

The majority of prostate diseases in this study were benign (85.7%), with HGPIN accounting for just 0.3% while 14.0% were malignant. A study by Bhatta and Hirachan,<sup>[4]</sup> also showed benign prostate lesions (89.58%) predominating over carcinoma (8.34%) and HGPIN (2.08%), while Yadav *et al.* recorded 93% and 7% for benign and malignant lesions, respectively.

The frequency of all prostate diseases in this study rose steeply from the 6<sup>th</sup> decade, peaked at the seventh decade of life after which it declined gradually until the 9<sup>th</sup> decade of life [Table 1]. This finding is not different from many other studies within and outside Nigeria.<sup>[7,13]</sup> However, some reports from the Caucasian series show a steady progressive rise in the incidence with a peak at the 9<sup>th</sup> decade of life.<sup>[13]</sup>

Nodular hyperplasia of the prostate whether in its pure form or in combination with chronic prostatitis was the most frequent lesion of the prostate observed in this study. It accounted for 85.5% of the prostate biopsies reviewed. Similar studies in Benin City, Nigeria, reported 74.9%<sup>[13]</sup> while (80.3%)<sup>[14]</sup> and (85.0%)<sup>[7]</sup> were reported in Saudi Arabia and

India respectively. Nodular hyperplasia microscopically shows proliferation of epithelial and fibromuscular stromal cells in nodular configurations. Some of the glands are cystically dilated with papillary infoldings and contain thick secretions in their lumen called corpora amylacea. The glands are lined by a double layer of epithelium [Figure 2].

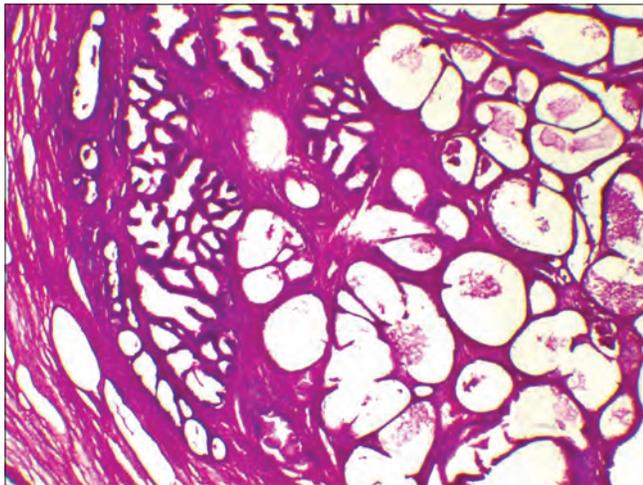
Prostatitis is inflammation of prostate glands. It can be acute, chronic, or granulomatous.<sup>[6]</sup> Acute prostatitis occurs when there are neutrophils within glands and stroma, intraductal cellular debris, and stromal edema. This type of prostatitis is uncommon in surgical specimens.<sup>[1]</sup> No case of acute prostatitis was reported in this study. Chronic prostatitis is however more common whether in its pure form or coexisting with nodular hyperplasia. In this study, nodular hyperplasia with coexisting chronic prostatic inflammation was seen in 41 (6.5%) cases, whereas only one case (0.2%) of chronic prostatic inflammation without nodular hyperplasia was recorded. Chronic inflammation involves the prostate usually in periglandular distribution and contains an admixture of plasma cells, lymphocytes, and histiocytes.<sup>[1]</sup>

PIN is the most established precursor of carcinoma of the prostate.<sup>[4,5]</sup> Clinical studies suggest that PIN predates carcinoma by 10 years or more, with low-grade PIN first

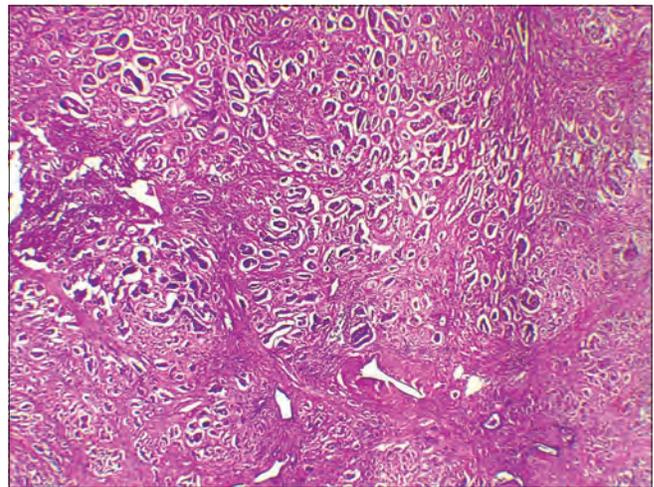
appearing in men in their thirties. The findings of PIN indicate the need for repeated biopsy and follow-up because they are at risk for malignancy, especially in patients with elevated serum PSA concentration.<sup>[5]</sup>

Two cases (0.3%) of PIN, both of which were HGPIN, were seen in the 7<sup>th</sup> and 8<sup>th</sup> decades, respectively, in this study. Aligbe *et al.* in Benin City, Nigeria recorded two cases (0.2%) of HGPIN similar to our finding. A case of HGPIN (0.44%) was seen by Deshmukh *et al.*,<sup>[15]</sup> while a couple of studies in India also recorded two cases (1.3%) and (2.08%) each of PIN, all of which were HGPIN.<sup>[4,5]</sup> These findings of ours and others mentioned above showed that HGPIN is relatively more frequent than its low-grade counterpart. It may also be attributable to lack of consensus as to the histological criteria required to diagnose low-grade PIN

Prostate cancers accounted for 14.0% of all prostate diseases seen in this study, of which 13.4% were acinar adenocarcinoma [Figure 3], while only 0.6% were ductal adenocarcinoma (carcinoma of large duct type). This study showed a steep increase in the frequency of prostate cancer from the 7<sup>th</sup> decade with a peak in the 8<sup>th</sup> decade of life. This is similar to several previous studies in Port Harcourt, Nigeria,<sup>[9]</sup>



**Figure 2:** Photomicrograph showing cystically dilated glands with some papillary infoldings in nodular hyperplasia of the prostate (H and E, ×40)



**Figure 3:** Photomicrograph showing small glands lined by a single layer of cells with moderate intervening stroma equivalent to (Gleason 3 + 3) in acinar type adenocarcinoma of the prostate (H and E, ×40)

**Table 1: Age distribution, histopathologic pattern, and frequencies of various prostatic diseases**

Histopathologic type	Age (years)								Frequency, n (%)
	<40	40-49	50-59	60-69	70-79	80-89	90-99	100-109	
Nodular hyperplasia	1	11	80	187	151	62	7	2	501 (79.0)
Nodular hyperplasia+chronic prostatic inflammation		1	6	18	11	4	1		41 (6.5)
Chronic prostatic inflammation						1			1 (0.2)
Prostatic intraepithelial neoplasm				1	1				2 (0.3)
Malignant (adenocarcinoma)									
Acinar		1	11	29	35	8	1		85 (13.4)
Ductal				3		1			4 (0.6)
Total	1	13	97	238	198	76	9	2	634 (100)

and India.<sup>[15,16]</sup> However, Aligbe, Abubakar, and Anunobi *et al.*, all in Nigeria, reported peak age in the 7<sup>th</sup> decade. Few other studies outside of Nigeria such as Yadav *et al.* and Paul *et al.* also reported peak age in the 7<sup>th</sup> decade. These mixed findings suggest that prostate cancers were most prevalent between these two decades (7<sup>th</sup> and 8<sup>th</sup>) worldwide, especially in Africa, Asia, and the Middle East.

## CONCLUSION

This study has shown that prostate diseases generally are mostly prevalent in the 6<sup>th</sup> through 9<sup>th</sup> decades of life, with nodular hyperplasia being the most common lesion of the prostate.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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