

# Histopathological Pattern of Prostatic Lesions in Kano, Northwestern Nigeria: A 14-Year Review

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## Abstract

**Background:** Prostatic lesions are major afflictions of the aging men worldwide. High prevalence of prostatic neoplasm among the aged, their high incidence in the instances of obstructive uropathy, and many other complications with ensuing morbidity and mortality earn them a unique urologic placement. The epidemiological appraisals on the histology of prostatic lesions among men in Kano are not conclusive. The aim of this study was to review the spectrum of prostate lesions diagnosed with histopathology in Kano. **Methodology:** This was a retrospective review of histologically diagnosed prostatic lesions at Aminu Kano Teaching Hospital, Northwestern Nigeria, from 2005 to 2018. The data collated and analyzed were the age of patients and histological diagnoses. Summaries of these results were shown as mean of patients' age, patients' age range, frequency distribution tables, and some photomicrographs of the lesions. **Results:** A total of 4292 prostatic specimens were histologically diagnosed in the study. Nodular hyperplasia was the most common histological conclusion (75.9%), followed by invasive prostate cancer (23.5%). Many prostate cancer specimens have Gleason's scores of the poorly differentiated tumor (48.0%). The patient's age in both peaked at the age group of 60–69 years. Few specimens had prostatic intraepithelial neoplasia and inflammatory process. **Conclusion:** Nodular hyperplasia specimens had the highest of histological conclusions. The age profiles of prostate cancer patients were lower than those of the Western world. High-grade tumors weigh heavy among malignancies and hence the need for better biomarkers which may enhance early diagnosis and better treatment outcome.

**Keywords:** Neoplasm, nodular hyperplasia, prostatic lesions

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## INTRODUCTION

Prostatic lesions are among the foremost afflictions of aging men worldwide. Their neoplasm among the middle aged and elderly has the highest prevalence.<sup>[1]</sup> Nodular hyperplasia rank first in the prevalence among these lesions and is seen in about a fifth of men at 40 years of age, 70% at 60 years of age, and up to 90% at 80 years of age.<sup>[2]</sup> In addition, analysis of inpatient care in a West African urology center revealed that 44.24% was for nodular hyperplasia treatments and of its complications.<sup>[3]</sup> A 10-year retrospective appraisal of the cancer catalog in Kano affirmed prostate cancer as the most common male cancer.<sup>[4]</sup> Separate studies also attested to a rising rate of prostate cancer with the potential of merging with current endemic infections and infestation as a principal public health dilemma in the developing world.<sup>[1,5]</sup> Prostatic

intraepithelial neoplasia (PIN), perchance the predecessor to prostatic carcinoma, is credited with the concept of the multistep carcinogenesis of prostate cancer. PIN is classified as low-grade PIN and high-grade PIN.<sup>[6]</sup> Prostatitis occurs in nearly 10%–15% of adult males and can coexist with nodular hyperplasia. It can be categorized as acute or chronic, specific or nonspecific, and granulomatous prostatitis.<sup>[2]</sup>

The above peculiarities of prostatic lesions plus their preponderance in the instances of obstructive uropathy,

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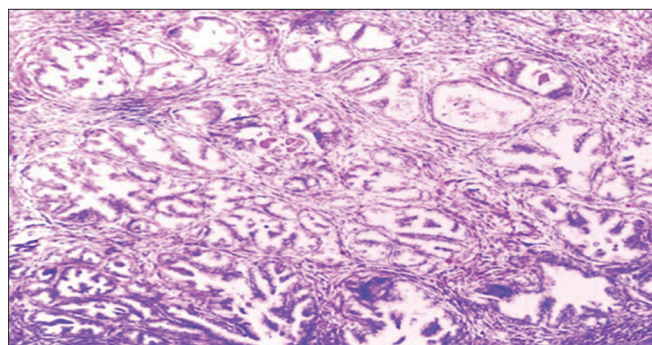
obstructive nephropathy, obstructive uremia, and numerous other complications with ensuing resultant morbidity and occasional mortality earn them a unique uropathological placement in the health-care delivery.<sup>[7]</sup> The epidemiological appraisals on the histology of prostatic lesions among men in Kano are, however, meager. The aim of this study was to review the spectrum of prostate lesions diagnosed on histopathology in Kano, Northwestern Nigeria.

## METHODOLOGY

This was a 14-year retrospective study on histologically diagnosed prostate lesions at Aminu Kano Teaching Hospital, Kano, Nigeria, from 2005 to 2018. The records of specimens submitted at the histopathology department for histological diagnosis were explored and all the prostatic specimens registered were listed out. The histology slides of all registered prostatic specimens were retrieved and histopathology conclusions were collated. Fresh sections were obtained from archived paraffined tissue blocks, microtome sliced was at 4  $\mu$ , and the sections were stained with hematoxylin and eosin wherever the slide could not be traced. Cases with an exhausted specimen and missing tissue blocks were excluded. Diagnosis for neoplastic lesions was based on the World Health Organization classification of prostate tumors.<sup>[1]</sup> The data were analyzed using SPSS version 20 (IBM Corp. Released 2011., IBM SPSS Statistics for Windows, Version 20.0, IBM Corp, Armonk, NY, USA), and the results were presented as mean of patients' age, patients' age range, frequency distribution tables, and some of these lesions' photomicrographs.

## RESULTS

A total of 4292 prostatic lesions were diagnosed with histology during the 14-year study period; this is equivalent to 5.9% of the total 72,404 specimens received for histological diagnosis. Trucut biopsies and prostatectomy specimens accounted for 2958 (69%) and 1,334 (31%), respectively. Nodular hyperplasia [Figure 1] comprised 3257 cases and represented 76% of prostatic specimens. Nodular hyperplasia was linked with prostatitis [Figure 2] in 81 (2.5%) nodular hyperplasia specimens. Patient's age ranged from 40 to 98 years with a mean age of 62.3 years ( $\pm$ standard deviation [SD] 12.20).



**Figure 1:** Nodular hyperplasia (H and E,  $\times 10$ )

Most specimens were from the age group of 60 to 69 years as shown in Table 1.

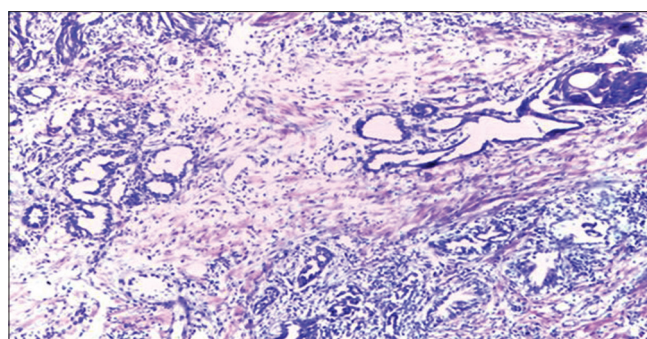
Prostate cancer constituted 1007 (23.5%) prostate specimens, and patient's age ranged from 41 to 97 years with a mean of 66.7 years ( $\pm$ SD 13.52). Adenocarcinoma of the prostate [Figure 3] was the most prevalent prostate cancer (93.7%) as revealed in Table 2.

Most of the prostate cancer specimens (47.9%) have Gleason's scores of poorly differentiated tumors [Figure 4] as revealed in Table 3.

Isolated inflammatory lesions were seen in < 1% of the specimens. Tables 4 and 5 show PIN categorization and distributions of inflammatory lesions with patient's age in Kano, respectively.

## DISCUSSION

Prostatic tissues were 5.9% of the 72,404 specimens subjected to histopathological analysis in the institution during the studied period. The tissues were prostatectomy or trucut biopsy specimens. Indications for the trucut biopsy included clinical suspicion of prostate cancer, elevated serum prostate-specific antigen (PSA), increased PSA velocity, or high PSA density. Clear-cut benign prostatic lesions are often diagnosed clinically complemented with normal serum PSA level and hence often do not require tissue histology. This 5.9% is, therefore, a significant sum. Patients with bladder outlet obstruction from nodular hyperplasia with no indication for operative treatment are offered medical or even conservative treatment. Nonetheless, nodular hyperplasia was found in 75.9% of specimens, whereas prostate cancer and PIN were established in 23.5% and 0.4%, respectively. These are comparable with other findings in literature.<sup>[8-10]</sup> Nodular hyperplasia as the dominant histological inference is similar to reports from various parts of the world. In Nepal, nodular hyperplasia was 89.58%, 87% in India, 87.5% in Pakistan, and 82% in Saudi Arabia.<sup>[11-14]</sup> In separate Nigerian populace, nodular hyperplasia was overwhelming as well. Nodular hyperplasia has a prevalence of 86% in Zaria, 75.4% in Jos, and 62.8% in Lagos.<sup>[10,15,16]</sup> The patient's age range in this review was 40–98 years though peak prevalence was among the age group of 60–69 years. This concurs with conclusions by Sharma *et al.*, Arya *et al.*, Kasliwal, and Kumar *et al.*<sup>[17-20]</sup> Prostatitis was



**Figure 2:** Nodular hyperplasia with chronic prostatitis (H and E,  $\times 10$ )

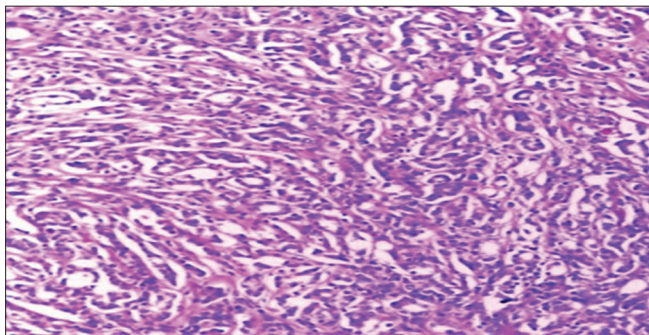
**Table 1: Histological type and age distribution of nodular hyperplasia in Kano**

Histological type	40-49 years	50-59 years	60-69 years	70-79 years	80-89 years	99-99 years	Frequency, n (%)
Nodular hyperplasia without inflammation	39	430	1,313	1,013	327	54	3176 (97.5)
Nodular hyperplasia with acute prostatitis	-	3	2	2	2	-	9 (0.3)
Nodular hyperplasia with chronic prostatitis	-	7	33	24	4	-	68 (2.1)
Nodular hyperplasia with schistosomiasis	-	-	2	2	-	-	4 (0.1)
Total	39	440	1350	1041	333	54	3257 (100)

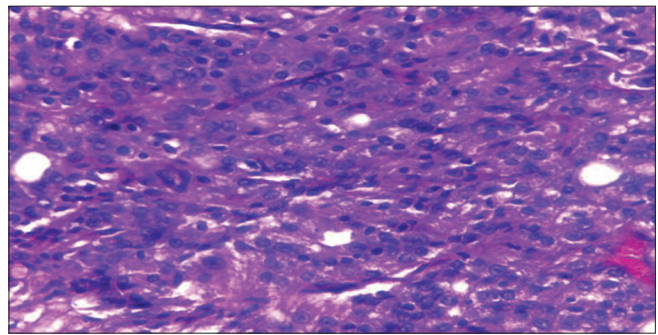
**Table 2: Histological subtypes of prostate cancers and patient's age distribution in Kano**

Histological type	40-49 years	50-59 years	60-69 years	70-79 years	80-89 years	90-99 years	Frequency, n (%)
Epithelial adenocarcinoma	11	87	370	331	123	22	944 (93.7)
Signet ring	1	-	4	1	-	-	6 (0.6)
Foamy cell	-	-	-	2	-	-	2 (0.2)
Carcinosarcoma	-	-	1	-	1	-	2 (0.2)
Urothelial carcinoma	1	4	11	13	2	-	31 (3.1)
SCC	2	2	3	3	-	1	11 (1.1)
Mesenchymal angiosarcoma	-	-	-	1	-	1	1 (0.1)
Metastatic tumor	-	1	1	5	3	-	10 (1.0)
Total	15	94	390	356	129	23	1007 (100)

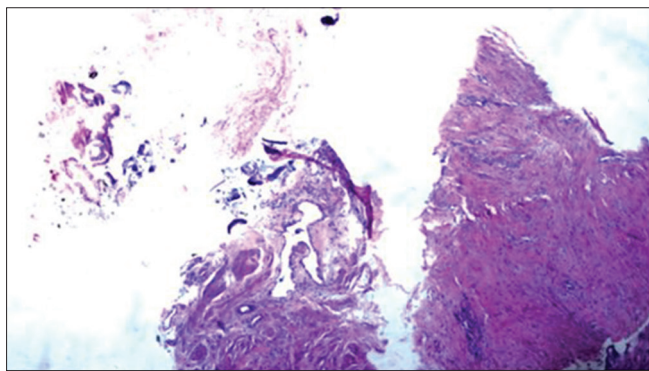
SCC: Squamous cell carcinoma



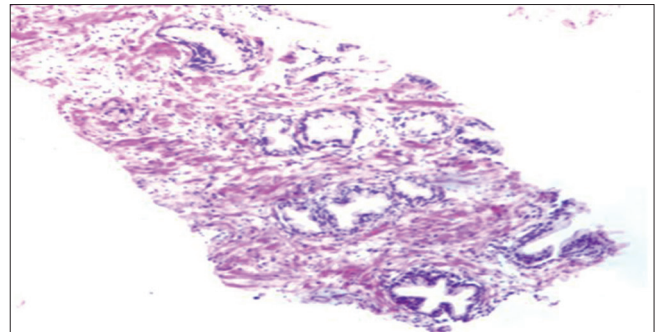
**Figure 3:** Adenocarcinoma of the prostate Gleason's score of 2 + 2 (H and E, ×10)



**Figure 4:** Adenocarcinoma of the prostate Gleason's score of 5 + 5 (H and E, ×10)



**Figure 5:** Nodular hyperplasia with schistosomiasis (H and E, ×10)



**Figure 6:** Prostatic intraepithelial neoplasia (H and E, ×10)

linked with 2.5% of cases of nodular hyperplasia in this study, of this 2.1% were chronic, 0.3% were acute, and 0.1% were specific granulomatous such as schistosomiasis [Figure 5].

This figure is little when matched with reports by Sharma *et al.*, which reported that prostatitis was in 33.06% of nodular hyperplasia and 86.42% of the prostatitis were chronic nonspecific prostatitis, 9.88% were acute prostatitis, and 3.7%

were granulomatous prostatitis.<sup>[17]</sup> Mohammed *et al.* and Bhatta *et al.* in two separate studies registered that 25% of nodular hyperplasia was juxtaposed with chronic prostatitis.<sup>[11,21]</sup> Similarly, Josephine and Patel and Surti reported chronic prostatitis in intermingled with nodular hyperplasia in 25.31% and 26.78%, respectively.<sup>[22,23]</sup> These variations could be due to varied conclusion criteria used by assessors and can be in up to 98% of prostate specimens.<sup>[24]</sup> Some pathologists pay little attention to inflammatory processes expect in samples with schistosomal or granulomatous prostatitis. Schistosomiasis seen in this series may be connected to its endemicity in the region of study.<sup>[25]</sup>

In this review, cancer of the prostate constituted 23.5% of all prostatic specimens; this is within 12.5%–30% range of the preceding reports.<sup>[16]</sup> The prevalence of prostate cancer was highest in specimens from 60–69 year age group. While this peak age coincides with other Nigerian and African studies, it is lower than the 8<sup>th</sup> decade observed among Caucasians.<sup>[26-32]</sup> Longer average life span plus a better living standard among Caucasians are perhaps tied to these differences. Adenocarcinoma accounted for 93.7% of prostate cancers, which agreed with reports in medical literature on its predominance histological subtypes.<sup>[21,33]</sup> The poorly differentiated prostate cancers were 48% of prostate cancer specimens which agreed with most appraisals from developing countries.<sup>[11,12,19]</sup> This, however, is contrary to reviews from the Western world where most diagnosis tends to be recognized early.<sup>[32]</sup> The disparity may similarly be

inclined to less access to health care, socioeconomic status, and cultural confinements plus tumor biological behavior. Tumor grade and stage are the most significant prognostic predictors for prostate cancer. Tumors with Gleason’s score of 8–10 often tend toward advanced cancer with poorer prognosis.<sup>[3]</sup>

PIN was observed in 0.4% of prostate specimens in our appraisal [Figure 6]; a close tally was registered in Nepal and India as well as in Jos and Lagos.<sup>[11,12,15,16]</sup> There are stacks of evidence linking PIN to prostate cancer and hence promoting the picture of PIN as an intermediary lesion between normal prostate and invasive cancer.<sup>[3]</sup> The supporting clue included the pair are more commonly found in the peripheral zone of the prostate. Moreover, PIN is often seen in contiguity to cancer, and in instances, cancer appears to bud off from the PIN. Multiple of the molecular mutations in cancers are present in a PIN. The finding of a high-grade PIN with elevated serum PSA is therefore by the standard, an indication for a repeat biopsy and long-term patient’s follow up.<sup>[4]</sup>

The limitations of the study included it is a retrospective institutional-based study. Not all the tissues’ specimens in the study region will get to our institution because of the size of the study domain and attached cost from histology. Similarly, nodular hyperplasia does not translate into clinical outlet obstruction from benign prostate hyperplasia.

### CONCLUSION

Nodular hyperplasia had the highest figure in the aggregate of studied prostatic tissue specimens. The age profile of prostate cancer patients was lower than those of the Western world. The prevalence of high-grade tumors weighs heavy among malignancies. This study heightens the need for a boost in biomarker profiling that will translate into meticulous management of prostate lesions. Screening for early detection may positively promote better therapeutic outcome.

**Table 3: Distributions of Gleason’s scores of adenocarcinomas of prostate/degree of differentiation**

Differentiation	Gleason	Number of cases (%)
Well differentiated	2-4	195 (19.3)
Moderately differentiated	5-7	329 (32.7)
Poorly differentiated	8-10	483 (48.0)
Total		1007 (100)

**Table 4: Histological subtypes and age distribution of prostatic intraepithelial neoplasia in Kano**

Histological type	40-49 years	50-59 years	60-69 years	70-79 years	80-89 years	90-99 years	Frequency, n (%)
Low-grade PIN	-	2	2	-	2	1	7 (43.8)
High-grade PIN	-	1	5	3	-	-	9 (56.2)
Total	-	3	7	3	2	1	16 (100)

PIN: Prostatic intraepithelial neoplasia

**Table 5: Histological subtypes and age distribution of inflammatory lesions of prostate in Kano**

Histological type	40-49 years	50-59 years	60-69 years	70-79 years	80-89 years	90-99 years	Frequency, n (%)
Acute prostatitis	1	-	2	-	-	-	3 (25)
Chronic prostatitis	-	1	2	-	1	-	4 (33.3)
Granulomatous							
Specific-schistosomiasis	-	-	1	2	1	-	4 (33.3)
Nonspecific	-	-	1	-	-	-	1 (8.3)
Total	1	1	6	2	2	-	12 (100)

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**Conflicts of interest**

There are no conflicts of interest.

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