



A histopathological study of prostate lesions in Awka, South-East Nigeria

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Abstract:

Introduction:

Diseases of the prostate gland are often associated with high morbidity and mortality if left undiagnosed in time. Common prostate diseases include: Nodular hyperplasia also known as Benign Prostatic Hyperplasia (BPH), cancers, prostatitis due to bacterial infections and parasitic infections of the prostate. Cancers of the prostate (CaP) are the most dreaded of all because the outcome is frequently grim in our society. Data show that CaP is the second most diagnosed cancer and amongst the leading causes of cancer deaths in males. We therefore, embarked on this study to determine the pattern of histopathological types of prostatic lesions seen in tertiary institution in South-East Nigeria.

Materials and Methods:

Surgical specimens received at the Department of Histopathology, Chukwuemeka Odumegwu Ojukwu University Teaching Hospital (COOUTH), Amaku-Awka, Anambra State, between January, 2013 and December, 2017 constituted the materials for the study.

Results:

Over the 5-year period, we processed a total of 252 prostatic tissue specimens. The age ranged between 46 years and 96 with a mean of 69.38 years \pm 9.94. A total of 127 BPH (50.4%) was diagnosed, followed by 121 CaP (48.0%) and 4 (1.6%) cases were inadequate for diagnosis. The mean age of patients diagnosed with CaP was 71.21 years \pm 11.164, while that of patients diagnosed with BPH was 67.60 years \pm 8.468. There was no significant age difference between men diagnosed with nodular hyperplasia and those diagnosed with cancers (p value = 0.844).

Conclusion: The BPH was the commonest disease of the prostate followed closely by Prostate cancer.

Keywords: Benign prostatic hyperplasia, Nodular hyperplasia, prostatic carcinoma

1. Introduction:

Prostatic Diseases Can Be Broadly Classified Into Three; the Non-Neoplastic Diseases, Neoplastic Prostatic Diseases and Miscellaneous Conditions. The Non-Neoplastic Prostatic Diseases Include: Inflammation And Infection, Prostatic Atrophy, Prostatic Metaplasia, Benign Prostatic Hyperplasia (BPH) And Prostatic Atypical Adenomatous Hyperplasia (Adenosis). Neoplastic Diseases Of The Prostate Include: Adenocarcinoma And The Unusual Primary Neoplasms And Secondary Neoplasms In The Prostate. The Miscellaneous Diseases of the Prostate Include: Prostate Intraepithelial Neoplasia (PIN) and Focal Glandular Atypia. Interestingly, Most Adult Male Patients Attending Any Urology Clinic With Lower Urinary Tract Symptoms Are Often Diagnosed With Nodular Hyperplasia (Also Referred To As Benign Prostatic Hyperplasia) With Or Without Inflammatory Changes And Carcinomas Of The Prostate.¹ Diagnoses Of Other Disease Types Are Pretty Rare.¹

Prostatic Diseases Are Common Occurrence In Male Patients Especially As Age Advances.¹ Most Of The Disease Processes Affecting The Prostate Gland Will Lead To Its Enlargement.² The Patients Usually Present With Either An Obstructive Or Irritative Urinary Bladder Symptoms Or Both Or May Be Completely Asymptomatic.³ Studies Have Shown Benign Prostatic Hyperplasia (BPH) To Be The Commonest Of The Prostatic Diseases Followed By Prostatic Cancer.¹⁻⁸ Cancer Of The Prostate (CaP) Is The Most Dreaded Of The Prostatic Diseases Because Of High Degree Of Morbidity And Mortality

Associated With It.⁹ Prostate Cancer Is Globally The Second Most Diagnosed Cancer In Men And The Sixth Cause Of Cancer Related Deaths.^{1,10} The Incidence Of Prostate Cancer Is Quite High Among The Black Population And Is The Commonest

Diagnosed Male Cancer.^{1,9,11-13} Unfortunately It Is Difficult To Differentiate Clinically Between BPH And Prostate Cancer At Their Early Stages.^{2,14} Histopathological Analyses Of Prostate Biopsy Specimen Is The Gold Standard For Making Diagnosis Of Prostatic Diseases.¹⁵ Studies Have Been Done On Prostatic Diseases But None Has Been Done On Histopathological Pattern In Our Institution.

We Therefore Embarked On This Study To Ascertain The Pattern Of Prostate Diseases In A Tertiary Teaching Hospital, South-East, Nigeria.

2. Materials and Methods:

This Retrospective Study Included All The Surgical Specimens Received At The Department Of Histopathology, COOUTH, Amaku-Awka, Anambra State, Between January, 2013 And December, 2017. Routinely, the Prostate Specimens Were Fixed In 10% Buffered Formalin Or 10% Formal Saline. Tissue Dehydration Was Done With Ascending Grades Of Ethanol And Clearing With Xylene. Subsequently, 3 μ m Thickness Of Formalin-Fixed Paraffin-Embedded Tissue Blocks Were Sectioned And Stained With Hematoxylin And Eosin. Data Extracted From The Surgical Day Book And Establishment Computer Database Were Entered Into

Microsoft Excel Sheets And Analyzed Using Predictive Analytical Software, Version 20 (IBM, SPSS Inc., Chicago, IL, USA), With Respect To Age, Frequency, Histological Types Of Lesion, And Gleason Grading For Prostatic Adenocarcinomas.

3. Results:

A Total Of 252 Prostatic Tissue Specimens Out Of 2,501 Histopathological Specimens Were Received And Processed Over The 5-Year Period In Review. This Constitutes 10.1% Of The Total Histopathological Specimens. The Age Ranged Between 46 Years And 96 With A Mean Of 69.38 Years \pm 9.94. The Overall Peak Age Group For Prostate Disease Was 60-69 Years Followed By 70-79 Years (Figure 1). A Total Of 127 BPH (50.4%) Was Diagnosed, Followed By 121 Cap (48.0%) And 4 (1.6%) Cases Were Inadequate For Diagnosis (Table 1). This Gives BPH/Cap Ratio Of 1.05:1. All The Prostate Specimens Were From Trucut (Core

Needle) Biopsy. The Mean Age of Patients Diagnosed with Cap Was 71.21 Years \pm 11.164 (Table 2), While That of Patients Diagnosed with BPH Was 67.60 Years \pm 8.468 (Table 3). The Peak Age Group For Cap Is 70-79 Years While That For BPH Is 60-69 Years (Table 4). There Was No Significant Age Difference Between Men Diagnosed With Nodular Hyperplasia And Those Diagnosed With Cancers (P Value = 0.844) (Table 5). All The Cases Of Prostate Malignancies Were Adenocarcinoma. All The Prostate Malignancies Were Graded According To Gleason's Scoring System. Out Of The 121 Cases Of Cap, 10 (8.3%) Had A Score Of 2-4 (Well Differentiated); 56 (46.3%) Had Score Of 5-7 (Moderately Differentiated) And 55 (45.4%) Had A Score Of 8-10 (Poorly Differentiated). Gleason's Score Of 6 Was The Commonest Constituting 45 (37.2%) Followed By Score of 8 Which Constitute 36 (29.7%) (Table 6).

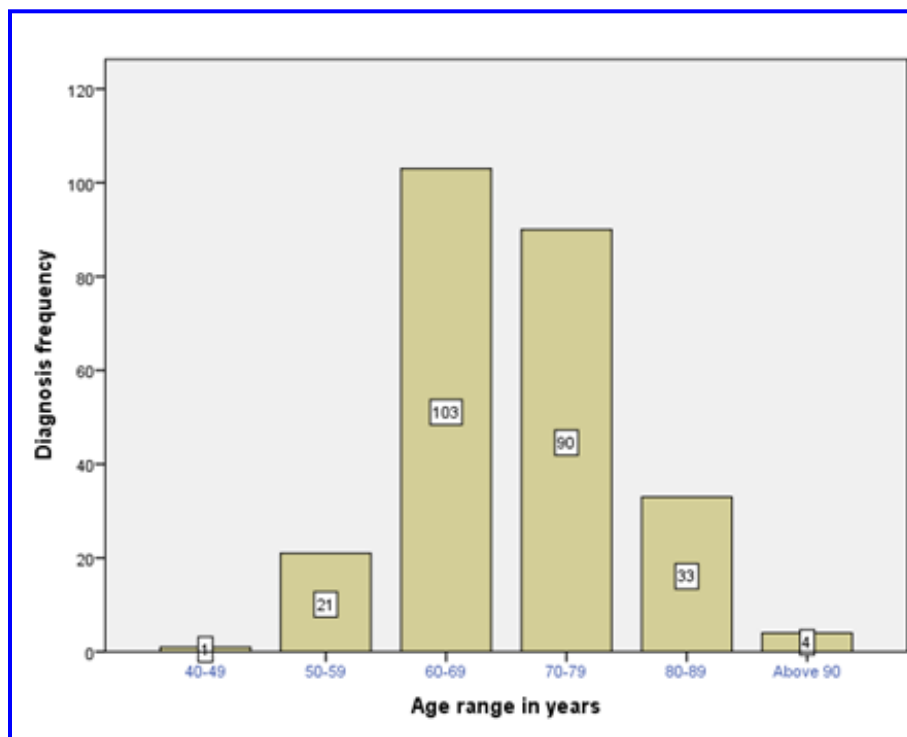


Figure 1: Bar chart showing overall age grouping for prostate disease.

Diagnosis		
	<i>Frequency</i>	<i>Percent</i>
Adenocarcinoma	121	48.0
Inadequate	4	1.6
Nodular hyperplasia	127	50.4
Total	252	100.0

Table 1: Frequency distribution of various prostate diseases.

	Age in years
Mean	71.21
Std. Deviation	11.164
Total number of patients	121

Table 2: Mean age of patients diagnosed with adenocarcinoma of prostate.

Measure of central tendency	Age in years
Mean	67.60
Median	67.00
Std. Deviation	8.468
Range	45
Minimum	46
Maximum	91
Total number of patients	127

Table 3: Measure of central tendency in age, patients diagnosed with Nodular Hyperplasia.

Ranges * Diagnosis Cross tabulation					
Age Range (Years)		Diagnosis			Total
		Adenocarcinom a	Inadequate for diagnosis	Nodular hyperplasia	
	40-49	0	0	1	1
	50-59	6	0	15	21
	60-69	41	0	62	103
	70-79	50	4	36	90
	80-89	21	0	12	33
	Above 90	3	0	1	4
Total		121	4	127	252

Table 4: Age grouping and diagnosis cross-tabulation.

			Sum of Squares	df	Mean Square	F	Sig.
AGE_Ca *	Between Groups	(Combine d)	3479.618	35	99.418	.736	.844
AGE_NH	Within Groups		11476.217	85	135.014		
	Total		14955.835	120			

Table 5: ANOVA Table showing level of significance in age between CaP and BPH.

Gleason's score	Number of cases	Percentage of cases
4	10	8.3
5	3	2.5
6	45	37.2
7	8	6.6
8	36	29.7
9	12	9.9
10	7	5.8
Total	121	100

Table 6: Gleason's score for patients with CaP.

4. Discussion:

Patients Presenting With Prostate Disease Are Referred To A Urology Centre For A Definitive Surgical Treatment After The Initial Definitive Histological Diagnosis. As A Consequence, The Common Prostatic Biopsies Received And Processed In The Department Of Histopathology Over The Study Periods Were All Trucut Biopsies. The Study Showed That Prostate Specimens Collected Over The Five-Year Study Periods Were 252 Out Of 2,501 Total Histopathological Specimens, Constituting 10.1% Of The Total Specimens. This Value Is Much Higher Than 2.4% Reported By A Study In India⁴, 6.5% In Lagos¹, 3.2% In Jos¹⁶, 7.4% In Kano¹⁷ And 3.6% In Another Study In Lagos¹⁸. This Shows The Increased Awareness Of Prostate Diseases In Our Environment And Also Increasing Awareness With

The Years As Most Of The Other Studies Were Done Earlier.

The Overall Age Of The Patients In This Study Ranged From 46-96 Years And Showed Progressive Increase With Peak At 60-69 Age Group Followed By 70-79 Years (Figure 1). The Overall Age Mean For Prostatic Diseases In The Current Study Is 69.38 Years \pm 9.94. This Is Similar To Age Range Of 37-100 Years And Median Age Of 68 Years In A Study By Mosli Ha Et Al⁵ In Their Study Of 330 Men In

Saudi Arabia With Prostate Disease. Studies Have Shown Prostatic Diseases Generally Increases With Aging.^{1-3,19} The Prostate Glands Unlike Most Other Organs In The Body Undergo Progressive Hyperplasia With Advancing Age.¹⁹ The Changes Have Been Shown To Be Both Microscopic And

Macroscopic.¹⁹ The Hyperplastic And Hypertrophic Changes Of Various Components Of The Prostate Gland Lead To Prostate Enlargement And Progressively Give Rise To Lower Urinary Tract Symptoms.^{3,19}

In The Current Study, The Ratio Of Bph To Prostate Cancer Is Very Narrow At 1.05:1. This Finding Varies Widely With The Usual Findings In Other Studies On Prostatic Diseases Which Show Predominance Of Bph Over Cap.^{1,6,11,16-18} The Ratio In The Study By Obiorah Cc Et Al¹¹ In Port Harcourt Was 1.67:1; 2.1:1 By Nwafor Cc Et Al¹ In Lagos; 2.5:1 By Anunobi Cc Et Al¹⁸ Also In Lagos And 4.6:1 By Albasri A Et Al⁶ In Saudi Arabia. The High Cap Ratio In The Index Study Is Most Likely Because All The Patients In The Study Had Needle Prostate Biopsy From A Suspected Cancer Of The Prostate Either From Clinical Assessment Or From Elevated Serum Prostate Specific Antigen (Psa) Tests. The Index Study Found More Bph Closely Followed By Cap and Four Inadequate Specimens Giving An Inadequate Rate Of 1.6% (Table 1). This Inadequate Rate Is Minimal Compared To The Finding In A Study In Port Harcourt¹ With Inadequate Rate Of 6.6%. Inadequate Sampling In Needle Biopsy Is Usually Operator Dependent And Commoner With Digitally Guided Biopsies More Than Image Guided.¹ Most Of The Inadequate Samplings Result From Collecting Specimen From The Apical Or Lateral Parts Of The Prostate And In A Lot Of The Cases Either Prostate Tissue Is Sparse Or Only Rectal Tissues Are Collected.¹

Benign Prostatic Hyperplasia (Bph) Is The Commonest Prostatic Disease Followed By Carcinoma Of The Prostate And Distantly By Others Like Prostatitis (Both Acute And Chronic) And Prostatic Intra-Epithelial Neoplasia (Pin).¹⁻⁸ Acute And Chronic Prostatitis Are Associated With Bph In A Lot Of Cases Due To Urinary Tract Obstruction.¹⁵ Chronic Prostatitis Which May Be Specific Or Non-Specific May Be Caused By Tuberculosis, Schistosomiasis Or Some Fungal Infections, Are Rare Occurrence.^{13,15} Prostatic Intra-Epithelial Neoplasia (Pin) Are Also Rare.²⁰ They Are Viewed As Pre-

Malignant Conditions And Are Further Divided Into 2 Categories (Low Grade And High Grade).^{4,20} Only Bph And Cap Were Found In The Index Study Probably Because All The Samples Were From A Needle Biopsy. Carcinoma Of The Prostate Is Very Common In This Study And It Is Almost Equal In Occurrence To Bph. All The Caps Are Adenocarcinoma. This Finding Is Similar To The Finding Of Predominantly Adenocarcinoma In Some Other Studies.^{4,6,11}

Both Bph And Cap Increases With Aging.^{1-3,6,7,11,20} In The Current Study, The Peak Age Group For Cap Was In The 8th Decade (70-79 Years Group) With Age Mean Of 71.21 Years \pm 11.164 (Table 2). These Findings Correspond With The Findings In Similar Studies On Prostatic Diseases.^{2,11} In The Study By Odubanjo Mo Et Al³ In Lagos, The Peak Age Group For Cap Was 65-74 Years And The Mean Age For Their Patients Was 68.48 \pm 9.893 Years. Also In Other Studies By Albasri A Et Al⁶ In Saudi Arabia And Yadav M Et Al¹⁵ In Ahmedabad, The Peak Age Groups For Cap Were 80-89 Years And 61-70 Years Respectively. These Were Slightly Different From The Peak Age Group In The Index Study. In This Study Also, The Peak Age Group For Bph Was 60-69 Years With Mean Of 67.60 Years \pm 8.468 (Table 3). Other Studies Also Show Peak Age Group For Bph To Be In The 7th Decade.^{7,15,20} On The Other Hand, Study By Albasri A Et Al⁶ Shows Slight Difference In Age Peak For Bph. They Found In Their Study That The Peak Age Group For Bph Was 70-79 Years With Mean Age Of 69.2 Years.

All The Prostate Malignancies in This Study Were Graded according To Gleason's Scoring System. This Is a Modification of Gleason's Grading That Categorizes Cap According To The Degree Of Differentiation From Undifferentiated With Value Of 5 To Well-Differentiated With Value Of One. Gleason's Scoring Therefore Sums Up The Values Of The Most Predominant Grade With That Of The Second Most Predominant Grade In A Scoring System Ranging From 2-10. Gleason's Scoring Is The Most Popular System For Grading Cap Worldwide.^{1-3,5,6,9,11} It Is Very Reproducible And A Very Good

Predictor Of Prostate Cancer Progression And Survival.^{1,11} Studies Have Shown That Men With Gleason's Score Of ≤ 6 Have A Good Disease Progression Free Survival While Those With Gleason's Score Of ≥ 7 Have A High Risk Of Death From Prostate Cancer.^{1,11}

In The Current Study, Out Of the 121 Cases Of Cap, 10 (8.3%) Have A Score Of 2-4 (Well Differentiated); 56(46.3%) Have Score of 5-7 (Moderately Differentiated) and 55 (45.4%) Have A Score Of 8-10 (Poorly Differentiated). Gleason's Score of 6 Is The Commonest Constituting 45 (37.2%) Followed By Score Of 8 Which Constitute 36 (29.7%) (Table 6). The Finding In Our Study Shows That Most Of The Patients With Cap Were Either On The Moderately Differentiated Or Poorly Differentiated Range. In A Study By Odubanjo Mo Et Al³ In Lagos, Gleason Scores 6 And 8 Were The Most Common (23.3 And 20% Respectively). Nwafor Cc Et Al¹ In Another Study In A Private Lab In Lagos Found That Moderately Differentiated Cap (Gs 5-7) Accounted For 58.1% Of Cases, While Poorly Differentiated Cases (Gs 8-10) Accounted For 33.8% Of Cases, And Well-Differentiated Cases (Gs 2-4) Accounted For The Least Number Of Cases (8.1%). Forae Gd Et Al⁹ Also In A Study In A Private Set Up In Benin City Found Moderately Differentiated Cap To Be The Commonest (59.8%) Followed By Well Differentiated (30.4%) And The Least With Poorly Differentiated (9.8%). Obiorah Cc Et Al¹¹ In Port Harcourt Showed That Majority Of The Cases (60.6%) Presented With High Gs Of 7-10 With 8 As The Peak Score. All The Above Studies Done In Different Nigerian Cities Are Similar To The Index Study Showing Mainly Moderately And Poorly Differentiated Cap. Two Different Studies Done In Saudi Arabia By Mosli Ha Et Al⁵ And Albasri A Et Al⁶ Showed Moderately And Poorly Differentiated Pathological Types To Be Commoner Than The Well Differentiated Variety. The Above Findings Suggest Inadequate Screening Programs For Cap Resulting In Presentation With Advanced Disease And Poor Prognostic Index.

Conclusion:

Benign Prostatic Hyperplasia Is Still The Commonest Disease Of The Prostate Even Among Patients With A Clinical Suspicion Of Cap. However, Cap Is Very Common Presenting With High Gleason's Scores. Efforts On Better Organized Screening Protocol For Men Above The Age Of 40 Years Are Advocated.

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