Original Article

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Histochemical Characters of Prostatic Intraepithelial Neoplasia

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Abstract

Benign Prostatic hyperplasia (BPH) and carcinoma prostate are increasingly frequent with advancing age. Prostatic intraepithelial neoplasia (PIN) is the most established precursor of prostatic carcinoma. HGPIN and prostate cancer share genetic and molecular markers as well, with PIN representing an intermediate stage between benign epithelium and invasive malignant carcinoma. The clinical significance of HGPIN is that it identifies patients at risk for malignancy. Purpose of this study was to find out the incidence of prostatic intraepithelial neoplasia (PIN) and to study the histochemical characters of PIN and prostatic adenocarcinoma. *Method:* The present study included prostatic tissue specimen of 150 cases received in the pathology Department during period of April 2013 to December 2014. Histopathological evaluation of all cases were done in the department. *Results:* PIN accounted for 8.6% (13 cases) with a peak incidence in age group of 70-79 years. LGPIN accounted for 8% (12 cases) and HGPIN accounted for 0.6% (1 case).

Keywords: Benign Prostatic Hyperplasia; Prostatic Intraepithelial Neoplasia (PIN).

Introduction

Prostate is essential structure of the male reproductive system composed of glands and stroma and its secretions forming 30 - 50 % of the seminal fluid volume [1].

With increasing life expectancy, increasing awareness and better health services lesions of prostate has become a common specimen received for diagnostic of both benign and malignant lesions. Most patients of benign lesions present with complaints related to micturition and incontinence.

Carcinoma prostate is an important health problem of elderly male population, and pose a challenge to urologists, radiologists and pathologists [1].

Currently, many men are identified as having early prostate cancer through the use of prostate specific antigen screening [2,3]. Carcinoma of the prostate is the most common malignant tumor in men over the age of 65years [4]. Carcinoma prostate is the most frequently diagnosed cancer in men next to carcinoma lung and according to national cancer registries in India it is the second leading site of cancer [5,6].There is parallel rise in incidence with advancing age of BPH and prostate carcinoma [7].

Benign prostatic hyperplasia (BPH) is a common urological condition in men. The prevalence of BPH increases from 20% at 40 years of age to 90% by the eighth decade of life [8]. Prostatic carcinoma is globally the second most frequently diagnosed cancer and the sixth leading cause of cancer death in males [9]. In India, it constitutes about 5% of all male cancers [10]. Prostate-specific antigen (PSA), digital rectal examination, and transrectal ultrasound are the tools most commonly used to screen for prostate cancer. However, biopsy remains the gold standard for final diagnosis. Histological diagnosis of prostatic cancer is usually based on morphological features such as growth pattern, nuclear atypia, and absence of basal cells.

Although nodular hyperplasia can almost be considered as an aging process, the histological variations like different types of hyperplasia, low

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grade prostatic intraepithelial neoplasia (LGPIN) and high grade prostatic intraepithelial neoplasia (HGPIN) merits discussion.

Hence purpose of this study was to find out the incidence of prostatic intraepithelial neoplasia (PIN) and to study the histochemical characters of PIN and prostatic adenocarcinoma.

Method

The present study included prostatic tissue specimen received in the pathology Department during period of April 2013 to December 2014. The sample size was 150 cases with prostatic lesion. Brief clinical data were noted from the case records, which included the age presenting symptoms, digital rectal examination findings, and clinical diagnosis. The specimens thus obtained were fixed in 10% formalin. Prostate glands were examined grossly for dimensions and any other gross abnormality on external surface. In case of TURP, approximately 5gm of tissue was processed in one cassette and embedded. The entire tissue was processed in case of prostectomy representative bits were processed. Then section 4 to 6 microns thick were prepared. These were stained routinely with hematoxylin and eosin.

Other special stains like Alcian blue pH 1 , periodic acid Schiff (PAS) and Ziehl Neelson were performed wherever necessary. The procedure followed for tissue processing and staining technique are those given in "Cellular Pathology technique" by CFA culling. All the lesions were graded in to non neoplastic and neoplastic lesions. The cases of prostatic adenocarcinoma were graded using Gleason microscopic grading. The clinical and histological data so obtained were analyzed and compared with another similar studies.

Results

The adjacent tissue in these cases showed adenofibromyomatous hyperplasia in 10 cases, HGPIN in 6 cases and inflammation in 3 cases.

Table 1: Prostatic intraepithelial neoplasia cases studied

Lesions	No. of Cases
LGPIN with BPH	12
HGPIN with BPH	1
HGPIN with carcinoma	6

Table 2: Histopathological diagnosis in the cases studied

NH	
Without Prostatitis	98(65.3%)
With Prostatitis	25(16.6%)
PIN	
LGPIN	12(8.0%)
HGPIN	1 (0.7)
Adenocarcinoma	12(8%)
Metastatic TCC (from Urinary Bladder)	1(0.7%)
Squamous Cell Carcinoma	1(0.7%)

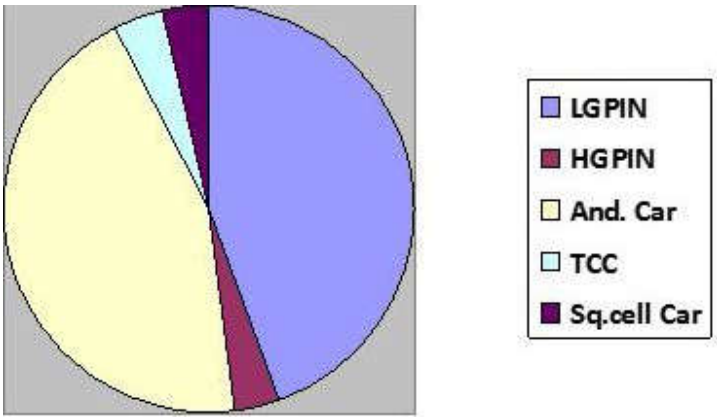

Fig. 1: Final histopathological diagnosis in the cases studied

Table 3: Microscopic findings in malignant lesions studied

Adjacent Prostatic Tissue	
Adenofibromyomatous hyperplasia	10
Inflammation	3
HGPIN	6

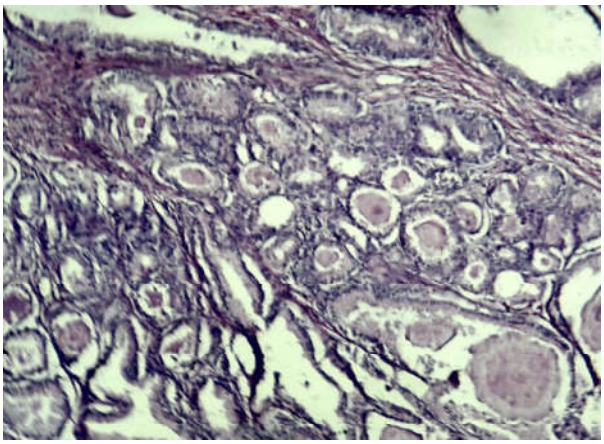

Fig. 2: Low grade Prostatic intraepithelial neoplasia (10x)

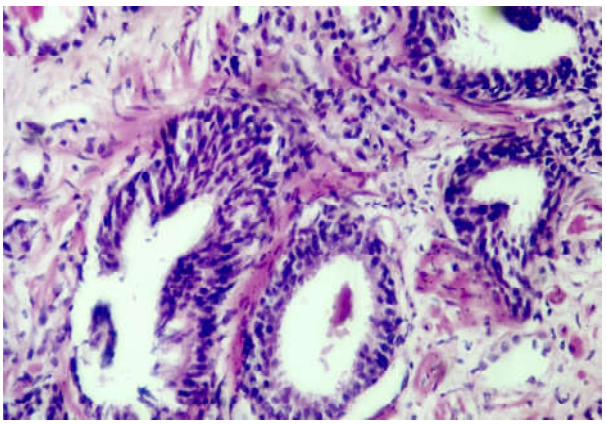

Fig. 3: High grade prosthetic intra epithelial neoplasia (45x)

Discussion

In the present study out of 150 specimens examined 19 cases showed PIN, 12 cases LGPIN which was associated with NH and 7 cases showed HGPIN out of which 1 was associated with NH and the rest 6 were associated with prostatic carcinoma.

LGPIN was characterized by epithelial crowding and stratification with anisonucleosis but no prominent nucleoli was observed.

HGPIN was characterized by pronounced epithelial crowding and stratification nuclear enlargement hyperchromasia with prominent nucleoli. None of these lesions showed disruption of basal cell layer and basement membrane .

In our study PIN was seen most commonly in the age group of 70 –79 yrs. In the study by McNeal and Bostwick frequency of PIN was highest in the age group 60 –69yrs [11]. In the study by Lee et al, the mean age of PIN was 65 yrs.

In our study out of 19 cases of PIN, 13 cases were associated with BPH out of which 12 were LGPIN and 1 was HGPIN. Out of 12 case of adenocarcinoma 6 showed HGPIN in the adjacent prostatic tissue.

Brawer concluded in his study that PIN occurred more commonly in prostates with invasive carcinoma than in without. According to his study PIN was found in 73% of prostates with carcinoma and 32% of prostates without carcinoma [13].

The incidence of PIN varies considerably in different studies probably because histological diagnosis of LGPIN shows subjective variation and many studies do not report LGPIN [12]. The incidence of HGPIN is relatively low in cases of prostatic carcinoma because most of the specimens were TURP which does not have enough material compared to radical prostatectomy which was studied in other studies [13]. It has also been suggested that transition zone carcinoma might not be associated with HGPIN [14]. Moreover incidence of isolated HGPIN is uncommon in TURP specimens (prevalence 2.3%) [15]. This is because the site of HGPIN is common in the peripheral zone as compared to transition zone.

Prostatic Carcinoma

In the present study peak incidence of both PIN and prostatic carcinoma was seen in age group of 70-79 yrs. It has been observed that PIN occur at least a decade earlier compared to prostatic carcinoma. But in present study no such age difference was noted.

Many recent studies show a higher incidence of prostatic carcinoma in the age group of 61-70 yrs. However in studies of Moore and Baron the peak incidence was seen in age group of 51-60 yrs. This may indicate change in trend of prostatic carcinoma.

Conclusion

PIN accounted for 8.6% (13 cases) with a peak incidence in age group of 70-79 years. LGPIN accounted for 8% (12 cases) and HGPIN accounted

for 0.6% (1 case). LGPIN were reported in view of complete description of histologic variants. Incidence of isolated HGPIN was low because most of the specimens studied included TURP, which is from transition zone, and HGPIN is common in peripheral zone. However HGPIN was noted in adjacent prostatic tissue in 6 cases (50%) of prostatic adenocarcinoma out of 12 cases of adenocarcinoma.

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