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Research Article

PROSTATIC INTRAEPITHELIAL NEOPLASIA AND ITS ASSOCIATION WITH BENIGN PROSTATIC HYPERPLASIA AND CARCINOMA PROSTATE

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ABSTRACT

Identification of premalignant lesion which help in early diagnosis of carcinoma prostate is a newer development in histopathology of prostate. Prostatic intraepithelial neoplasia is only one of these lesions and is best known. The aim of present study is to identify foci of PIN in ductoacinar lining epithelium of prostate and its association with benign prostatic hyperplasia (BPH) and carcinoma of prostate. Micro sections from 110 prostate specimens received in a tertiary care center were studied extensively and analysed. Our study revealed , out of 96 cases of BPH 29 (30%) showed PIN and out of 10 cases of BPH with adenocarcinoma 7 (70%) showed PIN whereas high grade PIN was observed in 3 cases (75%) of total 4 cases of carcinoma. PIN especially high grade type was the most commonly observed lesion in cases of adenocarcinoma, thereby suggesting it to be the most likely precursor of carcinoma prostate

Keywords: Prostate, Prostatic Intraepithelial Neoplasia, Adenocarcinoma Prostate

INTRODUCTION

For pathologist and Urologist there is currently one main issue in prostate pathology. This involves the early detection of prostatic carcinoma in preinvasive phase. Prostatic intraepithelial neoplasia is only one of these lesion and is the best known. The Prostatic intraepithelial neoplasia (PIN) endorsed in 1989, is defined as a cytologic alteration in architecturally normal glands. It comprises an intraluminal proliferation of the secretory epithelium revealing a spectrum of atypical cytological changes ranging from minimal changes to those indistinguishable from carcinoma. The morphological continuum that results in early invasive adenocarcinoma is now divided into two grades, low grade and high grade- replacing the previous three grades. High grade PIN has morphological, immunohistological, molecular and morphologic features similar to prostatic adenocarcinoma (Bostwick). PIN retains an intact or fragmented basal layer, unlike cancer which lacks a basal cell layer.

PIN especially high grade assumes importance as the most likely precursor of carcinoma of prostate. This study was undertaken to identify the association of PIN in prostate specimens and its role as precursor of carcinoma prostate.

MATERIALS AND METHODS

The present study was carried out in the pathology department of a tertiary care centre. A total of 110 prostectomy specimens, TURP chips and prostatic biopsy were studied extensively and analyzed. Tissue specimen were routinely fixed with formalin and processed. Haematoxylin and eosin staining was done. Microsections were examined and reported under high and low power of light microscope. Gleason's grading system was used in cases diagnosed as carcinoma prostate.

RESULTS

The cases were extensively studied for the presence and association of PIN with nodular hyperplasia and carcinoma prostate. They were placed in either of the following categories.

Category 1: Nodular hyperplasia and associated PIN
Category 2: Adenocarcinoma and associated PIN
Category 3: Nodular hyperplasia with adenocarcinoma together and associated PIN.

Out of 110 cases 96 cases (87.27%) were of Nodular hyperplasia. Category 1; 4 cases (3.63%) of Adenocarcinoma prostate i.e. category 2 and remaining 10 cases (9.09%) had both nodular hyperplasia and adenocarcinoma category; 3.

DISCUSSION

The incidence of prostates carcinoma is increasing rapidly in low risk populations. Increasing incidence rates in Asian Countries most likely are related to the "Westernization" of these low risk populations in a recent study.

Table 1: Distribution of Prostatic Lesions according to Age

	Up to 50yrs		51-60yrs		61-70yrs		71-80yrs.		>80yrs	
	No.	%	No.	%	No.	%	No.	%	No.	%
BPH	2	2.08	22	22.96	42	43.75	15	16.66	14	14.58
Prostatic Carcinoma	0	0	1	7.14	7	50	5	35.71	6	42.85

Table 2: Foci of associated Prostatic Intraepithelial Neoplasia irrespective of type in various categories

Category	Total No. of cases	No. of positive cases	Prostatic Intraepithelial neoplasia
1) BPH with PIN	96	29	30%
2) Adenocarcinoma with PIN	4	3	75%
3) Adeno + BPH+PIN	10	7	70%

Table 3: Grades of pin in cases of Benign Prostatic Hyperplasia and Adenocarcinoma Placed in various categories

Category	Total No. of Cases	Low grade PIN		High grade PIN	
		Number	Percentage	Number	Percentage
1	96	19	19.79	10	10.41
2	4	1	25	3	75
3	10	3	30	7	70

Table 4: Various Architectural Patterns of High Grade Pin

Category	Cribriform		Tufting		Flat		Micropapillary		Comedo	
	No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%
1(14 cases)	0	0	7	50	4	28.57	3	21.42	0	0
2(3 cases)	0	0	1	33.33	1	33.33	1	33.33	0	0
3(7 cases)	1	14.28	3	42.85	2	28.57	1	14.28	0	0

Table 5: Frequency of Inflammation and Squamous Metaplasia

Category	Inflammation		Squamous Metaplasia	
	No.	%	No.	%
1 96 cases	33	34.37	22	22.9
24 cases	1	25	0	0
310 cases	3	30	2	20

Hsing et al[9], relatively large increase in the incidence prostates carcinoma were observed in Asian countries during 20 year period. Hence in India early diagnosis of prostate can cancer and prognostic implications of various presentations is an important current issue among Urologists and Pathologist.

Our study revealed that the maximum number of cases of BPH and prostates carcinoma are in the age group of 61-70 yrs i.e. 43.75% and 50% respectively. A study by Bruce et al[7], says that after the age of 50, both incidence and mortality rated from prostate cancer increases at nearly exponential rate. The presence of cancer increases with age. By the age of 80, approximately 60% to 70 of men have evidence of carcinoma at autopsy Andrews et al[1].

A wide variation in the incidence and prevalence of PIN in Benign Prostatic Hyperplasia has been reported in the - world literature, ranging from 12.8% to 43% in different studies. (McNeal JE et al, Mijahortiz et al and Sakr WA et al)[10,14,19]. Our findings revealed a figure intermediate to these frequencies i.e. (30%) which is close to the study of Rikhi where Pin in BPH is 29.9%.

The association of PIN with Adenocarcinoma has always been observed to be higher, as is evident from earlier studies, (McNeal JE et al, Srigley et al and Qian J. et al)[10,23,16]. In these studies it was observed to be 76% to 100%. Our findings revealed 75% association of PIN with Adenocarcinoma and in cases where Adenocarcinoma and BPH were together it came out to 70%. Low grade PIN was the most commonly observed grade in cases of benign prostatic hyperplasia, whereas cases of adenocarcinoma showed high grad PIN as most commonly observed grade. Earlier investigators (Brawer MK et al)[4], have reported low grade. PIN in cases of BPH and a high grade PIN in carcinomatous prostates, reflecting a greater possibility of high grade PIN as a precursor lesion to carcinoma prostate.

Our study revealed that in cases of BPH, 19.79% cases show low grade PIN and 10.41% cases show H-PIN, whereas in cases of Adenocarcinoma there was 75% association of H-PIN and 25% that of L-PIN. In cases where both BPH and Adenocarcinoma, were as found together, 70% of cases show H-PIN and 30% cases of L-PIN. Thus high grade PIN was more commonly associated with carcinoma and low grade PIN with BPH.

Various architectural patterns of high grade PIN in cases of carcinoma (with or without BPH) in form of cribriform, tufting, flat micopapillary and Comedo forms have been reported by several authors with variable frequencies We identified tufting as the commonest pattern (42.06%). A study

by Rekhe identified cribriform as the commonest pattern in 55%, however different, patterns merged with each other from gland to gland although fields with only single pattern were occasionally observed.

A study by David Get al[8] shows that the grades of PIN are associated with a significant increase in its frequency and extent of disruption of the basal cell layer.

The significance of finding high grade PIN in TURP is not so clear. Although these men appear to be at increased risk for subsequent discovery of cancer. In our study we observed that PIN was found in 23 out of 45 cases of prostectomy and 15 out of 64 cases of TURP. Our study had only one case of true cut prostatic Biopsy, which revealed PIN. In study by Sangeeta Bet al[21] the prevalence of HGPIN among different, samples were 36 out of 39 radical prostectomy, 20ut of 2 prostate biopsy cases, 11 of 17 TURP cases and all 3 cystoprostectomy cases. In an elderly patient with high grade PIN on TURP, often no further work up instituted. In a younger man, a more aggressive work up to rule our a clinically significant tumor is warranted, If high grade PIN is found in TURP chips and the specimen has not been processed in entirety the remainder should be processed to look for infiltrating carcinoma

CONCLUSION

Thus, is suggested that in cases of PIN, especially higher grade, patients need close follow up observation and investigations to rule out existence of carcinoma, especially in the peripheral zone. This strategy is also substantiated by extensive literature on this subject.

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