Scholars Journal of Applied Medical Sciences
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: www.saspublishers.com

OPEN ACCESS

Pathology

To Study the Clinicopathological Correlation of Prostatic Hyperplasia and Prostatic Adenocarcinoma

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| **Received:** 19.03.2019 | **Accepted:** 27.03.2019 | **Published:** 30.03.2019
DOI: 10.36347/sjams.2019.v07i03.075

Abstract **Original Research Article**

Objectives: To study the clinicopathological correlation of prostatic hyperplasia and prostatic adenocarcinoma and to find out the incidence of occurence of prostatic intra-epithelial neoplasia (PIN) and adenocarcinoma in clinically diagnosed BPH cases in relation to age & clinical features. ***Materials and Methods:*** The present study titled *"*To study the clinicopathological correlation of prostatic hyperplasia and prostatic adenocarcinoma*"* was conducted among the patients at Index Medical College, Hospital & Research Centre, Indore from January 2017 to april 2018 in 100 patients excluding Patients who already underwent TURP. ***Conclusion:*** Histopathological examination of TURP specimen can accurately diagnose both PIN and Adenocarcinoma in cases of BPH in TURP specimen. But it can be done only when complete TURP specimen is being received and examined. Gleason score is the single most powerful predictor of prostate cancer prognosis and a basis of clinical management.
Keywords: Clinicopathological, Prostatic, Hyperplasia and Prostatic Adenocarcinoma.

INTRODUCTION

Benign prostatic hyperplasia (BPH) is one of the leading diagnoses affecting men of increasing age. By the age of 50 years, about 50% of men are diagnosed with BPH; by 80 years, 90% of men are diagnosed, and the greatest prevalence occurs among men ages 70 to 79 years [1].

In BPH, a proliferation of prostatic cells leads to an increase in prostate size, urethral obstruction, and lower urinary tract symptoms. Men with BPH can experience great discomfort with urination and may develop complications including recurrent urinary tract infections (UTIs) and renal failure [2].

BPH clinically manifest as lower urinary tract symptoms (LUTS) consisting of irritative (urgency, frequency, nocturia) and obstructive symptoms (hesitancy, a weak and interrupted urinary stream, straining to initiate urination, a sensation of incomplete bladder emptying). Prolonged obstructions may eventually lead to acute urinary retention (AUR), recurrent urinary tract infection (UTI), hematuria, bladder calculi, and renal insufficiency [3].

Prostate cancer is now the sixth most commonly diagnosed cancer in the world. It is the 5th cause of cancer in men and 4th in cancer mortality in India. Data from national cancer registries shows that incidence of certain cancers are on rise in India. The cancers which are showing significant increase in incidence rates include prostate, mouth and kidney among male population. Etiology of prostatic carcinoma is largely unknown today rendering disease prevention difficult.

The relationship between benign prostatic hyperplasia (BPH) and prostatic carcinoma (PC) has long been a subject of speculation and controversy. It is well known that BPH and PC frequently coexist in the same gland. Carcinoma has been incidentally found in 5-25% of prostates removed for benign hyperplasia. Autopsy data suggest that most prostate cancers (83%) develop in men who also have BPH elsewhere in the prostate, and that this association is consistent across all age ranges.

Clinical aspects of benign prostatic hyperplasia are not necessarily related to the size of the prostate but may be correlated with the histological composition of its volume. Histopathological analysis may, therefore, also have clinical and practical relevance. Histological examination of the prostate must also include the description of some important aspects which may be present or associated with BPH and which may condition the progression of this disease [4].

The present study is an attempt to study the clinicopathological correlation of prostatic hyperplasia and prostatic adenocarcinoma among patients in a tertiary care set up of central India

MATERIALS AND METHODS

The present study titled *"*To study the clinicopathological correlation of prostatic hyperplasia and prostatic adenocarcinoma*"* was conducted among the patients at Index Medical College, Hospital & Research Centre, Indore (*Gram Morodhat*, District Indore).

Study Design: Cross-sectional observational study

Study Population

Patients undergoing transurethral resection of prostate (TURP) for the diagnosis of benign prostatic hyperplasia (BPH) at Index Medical College, Hospital and research Centre, Indore were included in the study from January 2017 to April 2018 in 100 patients.

Methodology

Prostatic chips after TURP done for clinically diagnosed BPH and prostatic biopsies were obtained. Haematoxylin and Eosin (H & E) stained histological slides were being prepared from received TURP specimen and biopsies and light microscopic examination of these slides was being done.

- All the lesions were graded into non-neoplastic and neoplastic lesions. The cases of prostatic adenocarcinoma were graded using Gleason microscopic grading as well as staged according to TNM staging system.

The clinical and histological data so obtained were analyzed and compared with other similar studies.

Inclusion Criteria

1. Patient undergoing TURP for the clinical diagnosis of BPH in below given situations-
- Refractory urinary retention
- Recurrent urinary tract infections due to prostatic hypertrophy
- Recurrent gross hematuria
- Renal insufficiency secondary to bladder outlet obstruction
- Bladder calculi
- Permanently damaged or weakened bladders
- Large bladder diverticula that do not empty well secondary to an enlarged prostate

2. Patient undergoing biopsies for suspected prostatic carcinoma when present with BPH.

Exclusion Criteria

Patients who already underwent TURP

Investigation Details

Each slide was examined for-

- Prostatic intraepithelial neoplasia (PIN)
- Prostate carcinoma

RESULTS

As per histological diagnosis, out of total 100 cases, 50 cases were having BPH, 35 cases were having BPH with Chronic Prostatitis, 3 cases were having BPH with PIN and 12 cases were having with Prostatic Adenocarcinoma (Table no.1). Table no. 2 represents features of obstructions, frequency and hesitency were significantly high in BPH cases where as these were less in chronic prostatitis. Out of 11 positive cases of adenocarcinoma one showed lymph node metastasis.

Table no. 3 represents mean age: 65.97 years, Standard Deviation: 9.915 years, Minimum age: 50 years, Maximum age: 90 years. The study revealed that maximum incidence of BPH was 61-70 years. Majority of patients in other studies have also reported same incidence amongst males with age of 70-79 year. As the age advances the incidence of PIN & Adenocarcinoma also increases. In table no. 4 the incidence of PIN, Out of total 100 cases, PIN was present in 3 cases that is 3%. One case of HGPIN & 02 cases of LGPIN were reported. Out of 12 cases we encountered in clinically diagnosed BPH, more than 58% of the adenocarcinoma cases were in T1b grade of TNM classification (Table no. 5 & Figure no.1).

The gleason score is the grading system used to determine the aggresiveness of prostate carcinoma. In present study out of 12 cases, 11(91.67%) were having score between 1-4 and only 1(8.33%) had score between 5-7. (Table no. 6 & figure no. 2)

In table no. 7, the correlation between Gleason Grading and TNM Classification was found to be statistically insignificant with a p-value=0.3774. This correlation was being sought to assess if there is any association between two assessment techniques.

DISCUSSION

In this study, we included 100 cases, diagnosed clinically as Benign Prostatic Hyperplasia (BPH) without any clinical evidence of carcinoma. The histopathological examination revealed (Table 1) out of the total 100 cases, 50 were diagnosed as BPH, 35 for BPH with Chronic Prostatitis, 3 cases of BPH with PIN and 12 cases of Prostatic Adenocarcinoma. These histological diagnoses were being correlated with mean age, and clinical presentation [5].

The mean age for BPH was found to be 65.38 years, BPH with chronic prostatitis 65.11 years, BPH with PIN 74.33 years and Prostatic Adenocarcinoma 68.83 years. The retrospective review of records of 156 incidental prostate cancer patients between 2001 and

2012, found the mean age of incidental carcinoma to be 69.5 years found the mean age at the time of operation to be 72.6 years.

We also attempted to compare clinical profile of patients with histological diagnosis. Table 05 shows the comparison of various clinical groups in relation to groups. This correlation was found to be statistically significant. The histological diagnosis was compared among the three groups where clinical features were present or absent as well as a case of prostatic adenocarcinoma having lymph node metastasis. Clinical correlation of histological findings was also found to be statistically significant in the other studies performed [6].

In the present study, the prevalence of Prostatic Intraepithelial Neoplasia (PIN) was found among 3% cases (Table 7).The LGPIN & HGPIN are diagnosed based on the international criteria. The PIN can be identified by 3 important morphological criteria- a) darker lining of epithelial cells, b) lining thicker than adjacent normal ducts and acini and c) complex intraluminal proliferations. These characteristics under higher magnifications reveal a) varying degree of nuclear enlargement & pleomorphism, b) hyperchromasia & c) nucleolar prominence. The Prostatic Intraepithelial Neoplasia (PIN) is a precursor to some prostate carcinomas, was described in 1960 & it is divided into PIN grade I, II and III. Presently, it is subcategorised as Low Grade PIN (LGPIN) and High Grade (HGPIN) corresponding to Grade I and 2 & 3 respectively. LGPIN is usually in the peripheral zone[1]. This feature was evident in our study in 3 cases of PIN. Out of the total 3 cases of PIN, 2 (66.67%) were LGPIN and 1 (33.33%) was HGPIN. Study found that the incidence of HGPIN averages approximately 9% (range of 4% to 16%). Incidence varying from 2.1% to 16.5%. For clinicians the significance of HGPIN as a pre-malignant lesion for prostate cancer has been a word of caution for management of cases. On the other hand the consensus conference, has pronounced that LGPIN have no diagnostic or therapeutic significance. The occurrence of PIN in TURP specimens is relatively uncommon (2–4%). We also encountered only 3% cases, confirming that PIN is predominantly localized in the peripheral zone of the prostate gland [7].

Table-01: Distribution of cases according to histological diagnosis (n=100)

	Number	Percentage (%)
BPH	50	50.0
BPH with Chronic Prostatitis	35	35.0
BPH with PIN	3	3.0
Prostatic Adenocarcinoma	12	12.0
Total	100	100.0

Distribution of cases according to histological diagnosis

Table-02: Comparison of clinical features in relation to groups

Clinical Features	Histological Diagnosis				Total
	BPH	BPH with Chronic Prostatitis	BPH with PIN	Prostatic Adenocarcinoma	
Present	32	19	2	11	35
Absent	18	16	1	0	64
Lymph Node Metastasis	0	0	0	1	1
Total	50	35	3	12	100

Chi Square= 14.653; p-value= 0.023 (significant)

Table-3: Distribution of participants according to age (n=100)

Age	Number of Patients	Percentage (%)
40-50 years	7	7.00
51-60 years	28	28.00
61-70 years	32	32.00
71-80 years	24	24.00
81-90 years	9	9.00
Total	100	100.0

Table-4: Distribution of participants according to Prevalence of pin (n=100)

PIN	Number of Patients	Percentage (%)
Present	3	3.0
Absent	97	97.0
Total	100	100.00

Table-5: Distribution of prostatic adenocarcinoma cases according to tnm staging (n=12)

TNM Staging	Number	Percentage (%)
T1a	5	41.67
T1b	7	58.33
Total	12	100.00

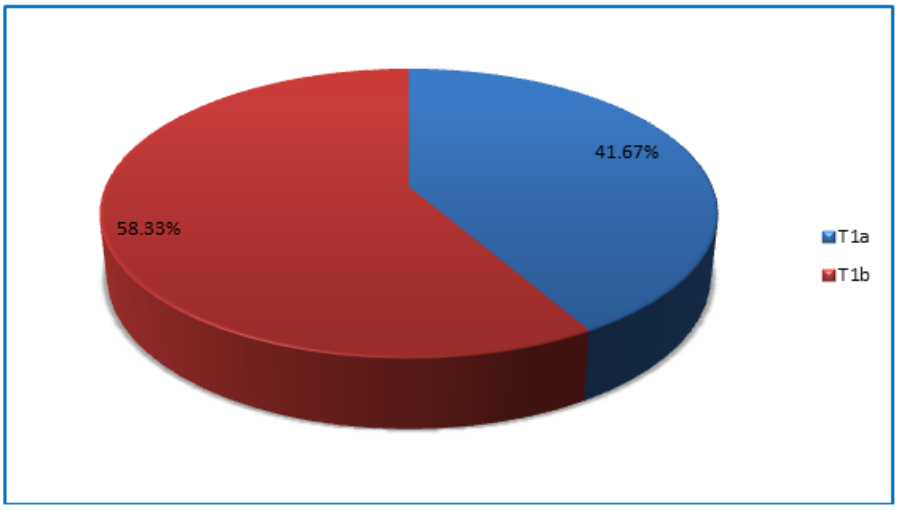

Fig-1: Distribution of prostatic adenocarcinoma cases according to tnm staging

Table-6: Distribution of prostatic adenocarcinoma cases according to gleason grading (n=12)

Gleason Score	Number	Percentage (%)
Grade 1 (Gleason score 1-4)	11	91.67
Grade 2 (Gleason score 5-7)	1	8.33
Total	12	100.0

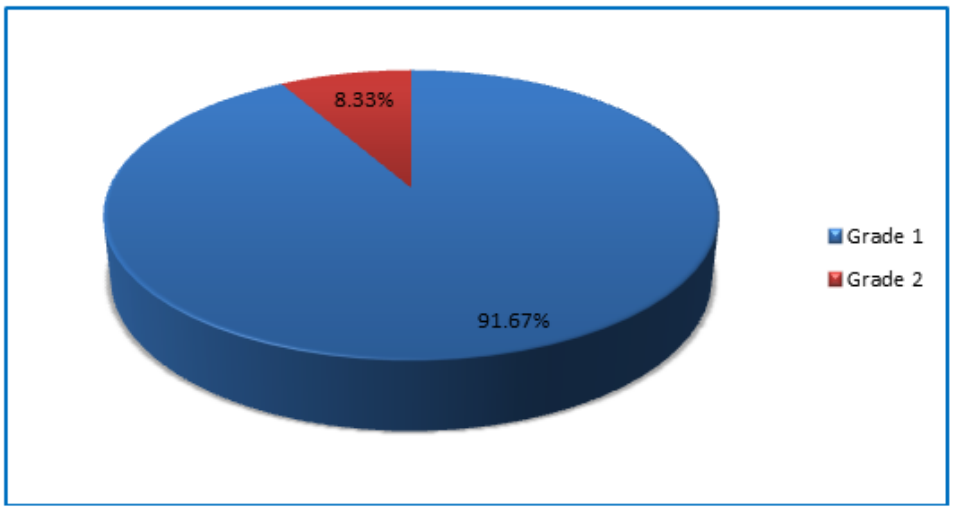

Fig-2: Distribution of prostatic adenocarcinoma cases according to gleason grading

Table-7: Association of gleason grading with Tnm classification

Gleason Grading	T1a	T1b
Grade 1	5	6
Grade 2	0	1
Chi-square= 0.779; df=1; p value= 0.3774 (insignificant)		

CONCLUSION

Histopathological examination of TURP specimen can accurately diagnose both PIN and Adenocarcinoma in cases of BPH in TURP specimen. But it can be done only when complete TURP specimen is being received and examined. Gleason score is the

single most powerful predictor of prostate cancer prognosis and a basis of clinical management.

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