

Histopathologic Spectrum of Prostatic Diseases and Prostate Specific Antigen Level

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Abstract

Aim: To delineate the histopathological pattern of prostate diseases and to correlate prostate specific antigen values and histomorphological features.

Methods and materials: A retrospective review was made of all prostate biopsy reports seen between January 2013 to December 2017 at Department of Pathology, Khaja Banda Nawaz Institute of Medical Sciences Kalaburagi, Karnataka. A total number of 164 biopsies was received at the department of pathology. All prostate biopsies were classified as Inflammatory and neoplastic lesions which comprise benign prostatic hypertrophy and carcinoma. Prostate specific antigen values were analyzed documented and correlated with histopathological findings. Hematoxylin and eosin stained sections were examined using paraffin embedded blocks.

Results: Mean age of presentation was 60.5±12.5yrs with maximum incidence in 7th decade of life. Out of 164 biopsies examined 85.97% (141cases) were diagnosed as benign prostatic hyperplasia with or without prostatitis, Two cases were diagnosed as High grade Prostatic intraepithelial neoplasia [1.23%] and 21 cases were adenocarcinoma [12.80%].

The most common gleason score was 7 (71.42%) followed by score 9 (19.04%), and score 4 (9.52%). Pattern 4 was most common predominant.

Most adenocarcinoma is well differentiated to moderately differentiate with Gleason's score of 4 to 9. Prostate specific antigen [PSA] is used as screening test for prostate carcinoma with PSA value in range from 4 to 140ng/ml.

Conclusions: In this study,

1. Benign Prostatic hyperplasia is commonest benign lesion and adenocarcinoma is histopathological type of prostate cancer.

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2. Prostate specific antigen [PSA] was in higher range in prostate cancer than in Benign Prostatic hyperplasia, hence PSA is good early indicator for malignancy
3. Histopathology examination remains the diagnostic test for confirmation of malignancy

Keywords: Prostate Adenocarcinoma; Benign Prostatic Hyperplasia; Prostate Specific Antigen.

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Introduction

Diseases of the prostate are common afflictions of men in particular prostatitis. Benign prostatic hyperplasia [BPH] and prostatic cancer are remarkably prevalent clinical disorders [1]. Prostate gland diseases cause significant morbidity and mortality. Prostate cancer is the second leading cause of death due to cancer in American men [2] and is the sixth leading cause of cancer death in men worldwide [3]. Despite the Prostate specific antigen [PSA] is close correlation with the disease, diagnosis of prostate cancer still requires histopathological confirmation. The most common histological type found in the biopsies in our study is benign adenomatous hyperplasia followed by adenocarcinoma, PSA is used widely as screening test for prostate carcinoma with PSA value ranged from 4 to 140ng/ml.

Clinical prostatitis is not often equated with histological inflammation but with acute infection of prostate [category 1] chronic infection of prostate [category 2], inflammatory chronic pelvic pain syndrome CPPS [category 3A], or non-inflammatory CPPS [category 3 b]. Histological inflammation may or may not be related to presence of clinical prostatitis [4].

Benign Prostatic hyperplasia may be classify as microscopic BPH, Macroscopic BPH and clinical BPH [5].

The foundation for histological diagnosis of adenocarcinoma of the prostate is the assessment of glandular architecture, arrangement of glandular epithelium and cytological features of glandular lining cells.

The most important prognostic attributes of adenocarcinoma in prostate biopsies are histological

grading and amount of tumor [6].

Prostate specific antigen is a glycoprotein serine protease, was first identified by wand et al. in 1979. It is widely used as tumor marker for prostate cancer.

Prostate specific antigen is a glycoprotein secreted by epithelial cells of the prostate, which is an tumor marker in the diagnosis of prostate adenocarcinoma. Its levels are elevated in pathological condition like prostatitis, hyperplasia and prostate adenocarcinoma.

A pretreatment serum PSA level not only predicts the grade of prostatic adenocarcinoma but also acts as an independent predictor of response to therapy [7].

The prostate cancer was graded and scored according to Gleason system. Gleason developed grading system for prostate carcinoma based on histological architecture of prostate tumor and has been modified from time to time [8]. Gleason pattern 1 has been excluded, pattern 2 is extinct and pattern 3, 4, 5 has been modified diagnostically by international society of urological pathology conference consensus [9]. A Gleason grade [primary + secondary = score] should be provided for all primary adenocarcinoma diagnosed in prostatic tissue.

Materials and Methods

Study was performed retrospectively January 2013 to December 2017 in department of Pathology, Khaja Banda Nawaz Institute of Medical Sciences kalaburagi, Karnataka. Total 164 prostate biopsies were received. Clinical information of patients including age, clinical symptoms, preoperative serum prostate specific antigen value and clinical

diagnosis were collected. 10% neutral buffered formalin is used as fixative. Routine paraffin processing of tissue and H&E staining was done. Gleason grading system was used to grade adenocarcinoma.

Results

A total of 164 prostate specimens were received at department of pathology, Khaja Banda Nawaz Institute of Medical Sciences Kalaburagi, Karnataka from January 2013 to December 2017. The cases were reviewed and categorized into 2 main groups Benign 141 cases [85.97%] and malignant 21 cases [12.80%] with prostatic intraepithelial neoplasia 2 cases [1.23%]

Age distribution of the prostatic lesions are ranged from Less than 50yrs to 90yrs (mean 70yrs) diagnosed with BPH and BPH with prostatitis, PIN, and malignant lesions of prostate.

Frequency of urination was most common presenting symptom [85 cases 51.82%] followed by difficulty in voiding [32 cases 19.51%] other symptoms was urgency, nocturia straining, incomplete voiding, difficulty in voiding, acute retention, hematuria and dysuria

In the benign group, benign prostatic hyperplasia [with or without inflammation] was the commonest prostatic lesion [141 cases & 85.97%]. The age range was less than 50 to 90 yrs with a mean of 70 yrs

Out of 141 cases of BPH, 39 cases were associated with prostatitis, out of which 2 cases of granulomatous inflammation which are Acid fast bacilli negative are observed.

Adenocarcinoma was the commonest histological subtype and seen in 21cases [12.80%] of all malignant lesions . Other type observed was 1 case of Transitional cell carcinoma and 1case of Adenosquamous cell carcinoma.

Table 1: Demonstrates age range distribution of Various prostatic lesions

Age group	BPH	BPH with prostatitis	PIN	Adenocarcinoma	Total
45-50	02	0	0	0	02
51-60	13	02	0	0	17
61-70	30	24	0	01	54
71-80	31	04	01	12	47
80-90	26	09	01	08	42
	102	39	02	21	164

The Gleason grading of 21 cases of adenocarcinoma showed moderately differentiated [Gleason score of 7] comprised the largest group with 15cases (71.42%) followed by poorly differentiated carcinoma [Gleason score of 9] 4 cases and (19.04%) and well differentiated carcinoma are 2 (9.52%) cases with Gleason score of 4. Pattern 4 was predominant pattern.

Perineural invasion was seen in 5 cases (%) out of 21 prostate carcinoma cases, among these 3cases had Gleason score 9 and 2 cases Gleason score 7.

Prostate specific antigen values were analyzed by chemiluminisence method and available data was present for all cases.

A cutoff point of 4ng/ml was taken .Values under 4ng/ml were considered negative for malignancy and values above threshold considered as positive for malignancy.

Maximum number of the benign cases (BPH & BPH with prostatitis) were seen in PSA range of 0-7ng/ml. Most of the PIN were seen in range 4-20ng/ml. Adenocarcinoma in the range of 4-140ng/ml. These results show positive correlation of serum PSA levels in benign and malignant lesions. Also reveals positive correlation between increase in PSA levels and adenocarcinoma.

Table 2: correlation of PSA level and various prostatic lesion

PSA innng/ml	BPH	BPH with prostatitis	PIN	Adenocarcinoma	Total
<4	67	22	-	0	89
4-10	28	05	01	01	35
10-20	05	07	01	04	17
>20	02	05	-	16	23
	102	39	02	21	164

Discussion

Prostatic disease cause a significant morbidity in older age group males all over the world. In our study period, we had total 164 specimens. One hundred and forty one specimens were benign (85.97%), 2 cases (1.23%) of PIN and 21 cases (12.80%) were diagnosed as adenocarcinoma.

Benign cases were reported in range of 62% in study conducted by jaffer et al., 2011 [10] to 88.5% by George and Thomas et al., 2004 [11]. The range of adenocarcinoma has been reported from as low as 28.9% from Nigeria , Anunobi et al., 2011 [12] and 28.5% from KSA [Mosli et al., 2009] [13].

Prostatism is common in the geriatric age group benign prostatic hyperplasia and prostatic carcinoma are increasingly frequent with advancing age and are uncommon below age of 40 yrs.

In our study group, age group with prostate diseases was 45-90yrs with mean age of 67.5, similar to study done by Lakhey M et al. and Lokuhetty MD et al. [mean age 67.61 and 69.7 years] [14,15].

The Gleason's grading of prostate carcinoma correlates with tumour aggressiveness, tumor volume, serum PSA level and prognosis. In this study, the most common Gleason score was score 7 and the most common predominant Gleason pattern was pattern 4 followed by pattern 3 and 5. These findings were also observed by deshमुख et al. [16], shirish et al. [17] and Josephine et al. [18].

Prostate specific antigen is a good tumor marker for monitoring the course of adenocarcinoma and also for early diagnosis. It should not be used alone for diagnosis of adenocarcinoma because it has less predictive value and it is also elevated in benign hyperplastic conditions [19].

Benign Prostatic hyperplasia cases had mean prostatic specific antigen value of 11.3ng/ml with normal level [4< ng/ml] found in 89 cases [54.26%]. Mild elevation [4-10ng/ml] seen in 35 cases [21.34%]; modest elevation [10.1-20ng/ml] was seen in 17 cases [10.36 %] ; marked elevation [>20ng/ml] seen in 23 [14.02%] cases.

This study is comparable with jasani et al. [20]

Conclusion

Benign prostatic hyperplasia is the commonest prostatic lesion in kalaburagi region of India, followed by prostate adenocarcinoma. This study were able to demonstrate statistically significant positive correlation between PSA levels and adenocarcinoma therefore, PSA levels can be recommended screening test for early detection of carcinoma prostate although malignancies were seen at low PSA levels also. Chances of malignancy increases with rising level of PSA. Every higher value must be followed by histopathological examination for confirmation.

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