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Pathology

KEY WORDS: Benign prostatic hyperplasia, Prostate cancer, Prostate specific antigen(PSA).

STUDY OF BENIGN AND MALIGNANT LESIONS OF PROSTATE WITH THEIR HISTOLOGICAL TYPING AND ITS CORRELATION TO PSA LEVEL

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ABSTRACT

Background: Prostatic carcinoma is an important growing health problem, presenting a challenge to urologists, radiologists and pathologist[1,2]. Prostate cancer is the leading cause of new cancer in men and is second only to lung cancer as a leading cause of cancer-related deaths in men[3].
Methods: Conventional haematoxylin and eosin (H & E) staining was done in all the 100 cases of benign as well as malignant lesion of prostate and their histological typing was correlated to PSA level.
Results: A total of 100 cases were studied, which were in the age group of 50-90 years. Benign prostatic hyperplasia was the commonest lesion. Malignancy was diagnosed in 12 patients and all cases were adenocarcinoma. Benign lesions were having PSA level less than 4ng/ml, while in the patients having carcinoma, the PSA level was up to more than 20ng/ml.
Conclusion: A strong correlation was found between serum PSA level and tumor diagnosis. Serum PSA level increases with increase of grade of tumor and correlate well with the tumor aggressiveness.

INTRODUCTION:

Prostate carcinoma is the most common occurring cancer type for men in USA, and for elderly men in Europe[4,5]. It is the second most common cause of cancer related death in men[4]. Because of the location of the prostate gland at bladder neck, enlargement of the gland leads to problems related to urinary obstruction[6]. The incidence of prostatic disease, benign prostatic hyperplasia, and carcinoma increases with age[6].

Prostate specific antigen(PSA) is the most useful tumor marker in diagnosis and first line test in screening[7]. It is established that higher the values of PSA are, the bigger is the volume of tumor existing in the patient, suggesting also a relation that is directly proportional to the tumor stage[8]. The grading of prostatic carcinoma by Gleason score is a good predictor of the pace of disease[9].

AIMS AND OBJECTIVES:

The present study was carried out with the objective, to find out benign and malignant prostatic conditions with their histological typing and level of PSA in these conditions and its correlation with these two.

MATERIALS AND METHODS:

The present study was carried out in individuals attending the out patient department, or admitted in the ward. The cases were selected on the basis of symptoms and clinical examination, then histological typing and PSA estimation was done to find its co-relation between benign and malignant prostatic lesion. Serum PSA level was measured by ELISA method using kits. This method utilizes solid phase enzyme linked immunosorbent assay based on sand-wich principal.

For histological typing and grading of the prostatic lesion, block preparation from biopsy specimen was done. The biopsy specimens were fixed in 10% buffered formal saline, followed by tissue processing, embedding and sectioning. The tissue sections were stained with haematoxylin and eosin and examined under light microscope.

RESULTS:

A total of 100 cases were studied. The age group involved in our study was from 50 to 90 years of age. The majority of benign lesions were in 50 to 70 years of age, while carcinoma was most common in 60 to 80 years of age[Table.1]. The cases were selected on the basis of symptoms and clinical examination directed towards the disease of prostate. The majority of patients had clinical complaints of weak urinary stream, prolong urination, abdominal straining, frequency, hesitancy and prolong emptying of the bladder[Table.2].

Table.1: Distribution of benign and malignant prostatic lesions among different age groups:

Age Group	BPH		PIN		PCA	
	Cases	Percentage	Cases	Percentage	Cases	Percentage
50-60	36	44.44%	2	28.57%	1	8.33%
60-70	35	43.21%	5	71.43%	8	66.67%
70-80	8	9.88%	-	0%	2	16.67%
80-90	2	2.47%	-	0%	1	8.33%

Table.2: Distribution Of Clinical Symptoms Among Study Population:

Symptoms	BPH		PIN		PCA	
	Present	Absent	Present	Absent	Present	Absent
Weak urinary symptom	75	6	7	-	11	1
Abdominal straining	63	18	5	2	10	2
Frequency	48	33	7	-	12	-
Hesitancy	54	27	5	2	5	7
Prolong emptying of bladder	47	34	6	1	12	-
Post urinary dribbling	29	52	5	2	11	1
Nocturia	31	50	3	4	2	10
Dysuria	21	60	4	3	7	5
Urgency	26	55	1	6	5	7
Hematuria	2	79	-	7	4	8

Then pre-operative biopsy from prostate was done in these cases and simultaneously serum PSA level estimation was done. Out of the 100 cases studied, 81 patients were of BPH, 7 patients of prostatic intraepithelial neoplasia (PIN) and 12 patients had prostatic carcinoma as diagnosed on histological examination [Figure.1-4]. Among the carcinoma of the prostate, six cases (50%) were of grade 4, five cases (42%) of grade 3 and one case (8%) was of grade 5 (using Gleason's grading system). The majority of patients in our study were found to have high grade carcinoma.

The PSA level was done in all the patients. The PSA level in patients

of benign prostatic hyperplasia and prostatic intraepithelial neoplasia was less than 4ng/ml, while in patients of prostatic carcinoma, the PSA level was up to or more than 20ng/ml [Table.3].

Table.3: Serum Psa Level In Different Benign And Malignant Condition Of Prostate Among Study Population:

Serum PSA level (ng/ml)	BPH		PIN		PCA	
	Cases	Percentage	Cases	Percentage	Cases	Percentage
0-2	48	59.26%	2	28.57%	-	-
2.1-4	33	40.74%	5	71.43%	-	-
4.1-10	-	-	-	-	1	8.33%
10.1-15	-	-	-	-	1	8.33%
15.1-20	-	-	-	-	5	41.67%
>20	-	-	-	-	5	41.67

DISCUSSION:

The present study was carried out on 100 patients, which were selected from out patient department on the basis of clinical symptoms. Biopsy was taken and histological diagnosis was made, serum PSA level was done, and its co-relation with benign and malignant condition of prostate was established.

In the present study, 87.65% of BPH were diagnosed at the age between 50-70 years, while 83.33% cases of carcinoma prostate were diagnosed at the age between 60-80 years. Maximum number of cancer patients were between 60-70 years of age. This is comparable with studies done by Mwakyoma HA et al, Jackson LA et al and Okolo CA et al10,11. Main presenting symptom in our study was weak urinary stream, which was noted in 93% of patients. While in the study of Khant VS et al12 retention of urine was the main presenting symptom, reported in 27.27% of cases.

In the present study, most of the population was suffering from benign enlargement of prostate (81%), small number of patients were diagnosed to have prostatic carcinoma (12%) , and only 7% of patients were found to have borderline histological picture, that is prostatic intraepithelial neoplasia (PIN) on histological examination. This study was comparable to the study by Khant VS et al12. In their study out of 110 cases, 37.2% revealed adenocarcinoma and the remaining 69% showed adenomyomatous hyperplasia with or without associated active prostatitis.

In the present study among 12 patients diagnosed as prostatic cancer, 6 (50%) of them were having grade 4 carcinoma, while 5 patients (42%) were having grade 3 carcinoma, and 1(8%) of the patient was found to have undifferentiated poorly prognosed grade 5 carcinoma. Gurumurthi D et al13, in their study have also found that majority (66.7%) had poorly differentiated adenocarcinoma, followed by moderately to poorly differentiated (27.5%). Only 25 of the cases were well differentiated. Similar findings were also reported in the study by Shirley SE et al14.

PSA testing has been used in clinical practice since 1986 and has led to changes in screening and the early diagnosis of prostate cancer, which is followed by earlier treatment15,16.The widespread use of PSA screening had led to an increase in overall survival. In the present study, patients who were suffering from benign condition of prostate were found to have PSA level below 4.0 ng/ml. While in prostatic carcinoma, PSA levels of patients were much elevated. Most patients (83.34%) had PSA level more than 15 ng/ml, while only one patient, out of 12 (8%) had PSA level under 10 ng/ml.

CONCLUSION:

To conclude, the most common histopathological finding, in patient of prostate with obstructive symptoms was benign prostatic hyperplasia. The frequency of prostatic carcinoma as compared to benign prostatic hyperplasia was very low. The most common histological type of prostatic carcinoma was adenocarcinoma. Prostate cancer cells produce more PSA than in benign prostatic hyperplasia and serum PSA level measurements correlate significantly and positively with Gleasons score.

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