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Pathology

CLINICOPATHOLOGICAL STUDY OF PROSTATE LESIONS IN CORRELATION WITH PROSTATE SPECIFIC ANTIGEN LEVELS

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ABSTRACT

Introduction- Benign prostatic hyperplasia and carcinoma are common diseases of advancing age. Serum PSA (prostate specific antigen) estimation is the most commonly employed test for screening and early diagnosis of prostatic carcinoma; but the test lacks sensitivity and specificity, as raised values are also present in benign lesions of prostate.

Objective- Correlation of serum PSA levels with histological diagnosis of prostatic biopsies to determine value of PSA in the diagnosis of prostate cancer.

Material And Methods- The study consisted of histopathological evaluation of 110 prostatic specimens, including 105 (95.45%) TURP , 4 (3.63%) needle biopsies and one open prostatectomy. Clinical data including age, presenting symptoms and serum PSA levels were recorded. Serum PSA values were correlated with histological diagnosis and grade of carcinoma.

RESULTS- Out of 110 prostatic specimens, most of the cases were BPH (87.27%). Prostate cancer constituted 12.72% of the total cases. Serum PSA measurements were available in 75 patients including 61 with BPH and 14 with carcinoma .Majority of patients with high PSA level were poorly differentiated with grade group 5 (50%) and grade group 4 (21.42%).

KEYWORDS : BPH, PSA

INTRODUCTION

Benign prostatic hyperplasia (BPH), prostatitis and prostatic adenocarcinoma are prostatic diseases, commonly encountered in elderly men in their sixties and responsible for considerable morbidity and mortality **[1]**. Prostate cancer is the second most frequently diagnosed cancer in men and the fifth most common cancer overall in the world population **[2]**. The prostate is composed of glandular epithelium and fibro muscular stroma. The luminal secretory cells produce prostatic acid phosphatase (PAP) and prostatic specific antigen (PSA). Measurement of PSA level is the first line screening tool for prostate carcinoma along with digital rectal examination (DRE) **[3]**.

PSA is an important tumor marker for prostate carcinoma **[4]**. Early diagnosis of prostate carcinoma is important as well as its differential diagnosis with other non- neoplastic lesions which mimic it clinically and pathologically. Hence, early diagnosis depends on appreciation of symptoms - signs and PSA estimation.

PSA level in the blood are increased in BPH, prostatitis, prostatic carcinoma, prostatic trauma and infarction. From 30 to 50 percent of patients with benign prostatic hyperplasia have elevated serum PSA concentrations, depending on the size of the prostate and the degree of obstruction, and the concentrations are increased in 25 to 92 percent of patients with prostate cancer, depending on tumor volume **(5)**. Moreover, PSA level is known to vary with age **(6)**. Measurement of serum PSA is the most sensitive marker available for monitoring the progression of prostate cancer and the response to therapy,but its value for the early detection and staging of prostate cancer is not known **(7)**. The present study was conducted to correlate preoperative PSA values with different pathological lesions of prostate along with clinic opathologic correlation.

MATERIALAND METHODS

The study was carried out in the deptt of Pathology, ASCOMS and hospital, Jammu from Nov 2017- Oct 2019. This study included 110 cases with prostatic biopsies including 105 transurethral resections (TURP), 4 needle biopsies and 1 open prostatectomy specimen. Serum PSA levels were estimated using chemiluminescent assay. The biopsies were fixed in 10% buffered formalin, processed and stained with Haematoxylin and Eosin for histopathological examination. The relevant clinical data of the patient was recorded regarding age, presenting symptoms, and PSA levels. Serum PSA values were available in 75 patients only.

RESULTS

110 prostatic specimens were examined histopathologically, consisting of 105 TURP specimens, 4 needle biopsies and 1 open prostatectomy specimen. Histopathological spectrum of lesions consisted of 96 (87.27%) cases of BPH and 14 carcinomas (12.72%). Chronic prostatitis was present in 20 (18.18%) cases including granulomatous prostatitis in 2 patients. All the cases of prostatitis were noted in association with BPH. Table 1 shows clinical presentation of prostatic lesions. Hematuria, intermittent stream, nocturia, urgency and acute retention were more frequent among malignant cases. PSA levels were available in 75 patients. Mean age of these patients with BPH was 67.32 years with a range of 54-85. Mean age of cancer patients was 70.28 years with a range of 60-82.

Table 1. Clinical Presentation Of Prostatic Lesions

PRESENTING CLINICAL SYMPTOMS	BENIGN (N=96)	MALIGNANT (N=14)	TOTAL
FREQUENCY	46 (47.91%)	4 (28.5 %)	50
URGENCY	30 (31.25%)	5 (35.71 %)	35
DIFFICULTY IN VOIDING	22 (22.91%)	2 (14.28%)	24
POOR STREAM	20 (20.83%)	3 (21.42%)	23
NOCTURIA	36 (37.5 %)	6 (42.85%)	42
ACUTE RETENTION	12 (12.5 %)	4 (28.57 %)	16
HEMATURIA	1 (1.04 %)	7 (50.0 %)	8
INTERMITTENT STREAM	18 (18.75%)	6 (42.85 %)	24

Table 2. Serum PSA Levels In All Cases Studied

PSA LEVELS (ng/ml)	BHP (N=61)	CARCINOMA PROSTATE (N=14)	TOTAL (N=75)
0-5	36	0	36
5.1-10	18	1	19
10.1-15	4	1	5
15.1-20	1	0	1
20.1-30	2	5	7
30.1-40	0	2	2
40.1-50	0	1	1
>50	0	4	4

Most of the patients with BPH had PSA values <10ng/ml (88.52%). Only 2 patients (3.27%) had PSA levels above 20ng/ml. Both of these patients had associated prostatic inflammation. 12 out of 14 cancer patients (85.71%), PSA levels were above 20ng/ml. None of the cancer patients had normal values of <5ng/ml.

Table 3. Correlation Of PSA Levels With Grade Group Of Cancer

PSA (ng/ml)	GRADE GROUP				
	I	II	III	IV	V
0-5					
5.1-10	1				
10.1-15					1
15.1-20					

20.1-30			1	1	3
30.1-40				1	1
40.1-50					1
>50		2		1	1

12 out of 14 cancer patients (85.71%), had PSA levels above 20 ng/ml, out of whom six belonged to grade group 5, three to grade group 4, one to grade group 3 and two to grade group 2. Only one case showing PSA level in the range of 5.1-10 ng/ml was from grade group 1, one showing level between 10.1-15ng/ml was from grade group 5. Hence majority of cancers with high PSA values were poorly differentiated with grade group 5 (50%) and grade group 4 (21.42%).

DISCUSSION

110 patients who underwent TURP, needle biopsy of prostate and open prostatectomy were included in our study. The pathologic specimens comprised of 105 TURP specimens, 4 needle biopsies and one open prostatectomy specimen. Needle biopsy under ultrasound guidance is used to diagnose prostatic carcinoma in patients with clinical suspicion of carcinoma. The detection rate of prostate cancer by transrectal ultrasonography (TRUS) biopsy has increased along with the utilization of both prostatic specific antigen (PSA) and digital rectal examination (DRE) as screening tests for prostate cancer. TURP specimens of BPH with lower urinary tract symptoms, sometimes show presence of incidental carcinoma.

BPH and prostatic carcinomas are the most common diseases of prostate. Most of our cases comprise BPH (87.27%). Prostate carcinoma was present in 12.72%.In 10 out of 106 TURP (9.43%) specimens, carcinoma was present incidentally. All the 4 needle biopsies were positive for cancer. Various studies of prostate biopsies in India have reported frequency of prostate carcinoma from 4.02% to 11.5 % **(8, 9, 10).**

BPH and carcinoma are diseases of advancing age. Most of the patients are above 50 years of age with a range of 50-80 years **(11, 12, 13).** Age in our study showed a peak in 7th decade with a range of 45-85years.

Hematuria, nocturia, intermittent stream, urgency and acute retention were common presenting symptoms in malignant cases. **Kohale et al (2016)** also reported higher frequency of hematuria and intermittent stream in cancer patients **(11).**

Prostate specific antigen (PSA) remains essential for prostate cancer diagnosis and management **(14).** Although, increased PSA levels have been found to be closely associated with prostate cancer, there can be different reasons for elevated PSA levels, including BPH, prostatitis, prostatic trauma, and prostatic infarction. 12 out of 14 (81.7%) of prostatic carcinomas in our study had PSA levels above 20ng/ml. Levels were between 5-10ng/ml and 10-20 ng/ml in one case each. Hence no cancer patient had normal PSA level.59.6% of BPH cases had PSA levels below 5 ng/ml and 29% between 5-10 ng/ml. 7 patients of BPH had PSA level above 10ng/ml including two cases above 20 ng/ml. Both the cases had chronic inflammation associated with BPH, one of them being granulomatous prostatitis. This shows that likelihood of carcinoma increases significantly with PSA level above 20ng/ml, although not specific for cancer. **Sarkar and Bhake (2017)** in their study found that PSA level above 10ng/ml can be used as criteria for diagnosis of carcinoma **(14)**. Our findings are in agreement with **Kohale et al (2016)** who found PSA values more than 20 ng/ml in 4.17% of their BPH cases and 85.7% in patients with cancer **(11)**. In the screening of prostate cancer, value of PSA remains controversial, in that it lacks sensitivity and specificity. Low cut off values for cancer may lead to unnecessary biopsies and detection of indolent tumors which don't require treatment. However, PSA is of immense value in cancer patients for follow up after treatment by surgery or radiotherapy to determine treatment response or recurrence. Majority of carcinomas with high PSA level were poorly differentiated with grade group 5 (50%) and grade group 4 (21.42%). However, no statistical analysis could be done because of lesser number of cancer cases in our study. **Sarkar and Bhake (2017)**studied PSA correlation with presence of prostate cancer grade found no statistical correlation of PSA level with Gleason score of the tumor **(14).**

CONCLUSION

Serum PSA levels are widely used in the diagnosis and management of prostate cancer. PSA levels are increased in both benign and malignant pathologies of prostate. The possibility of cancer is increased with rising amount of PSA, although not specific for it. Diagnosis can be confirmed only by histopathological examination of prostate biopsies.

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