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**Original Research Article**

# Diagnostic and Prognostic Significance of Prostate Specific Antigens (PSA), in Patients Suffering from Carcinoma Prostate, Attending in N.M.C.H., Patna

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**Abstract**
**Objective**: *The aim of Present study was undertaken to evaluate the level of prostate - specific antigen (PSA) in patients suffering from carcinoma Prostate along with their Histopathological correlations.*
**Materials and Methods**: *A total of 250 male patients, of different age groups, presents with various urological complains, attending in medical and surgical OPD were included in the study. All the demographic data were noted. After the diagnosis by PSA, 90 cases were operated and send for histopathological examination in our department. PSA evaluation was done by Chemiluminescens immunoassay (CLIA) methods by fully automated machine supplied by Roche pharma.*
*All data regarding routine tests (CBC, LFT, KFT, TSH, Blood sugar, USG Lower abdomen) were recorded.*
**Result**: *Out of 250 patients, 36.8% patients were in 61-75 years of age, followed by 34.4% in 51-60 years of age. 33.64% patients had benign prostatic hypertrophy (BPH) followed by 22.40% patients had prostatitis. 19.2% had suspected cases of Ca prostate. 23.06% patients were suffers from Ca prostate with nodal involvement and 1.2% patients had Ca prostate with distant metastasis. In hematological parameter maximum patients (63.6%) were found to have normal haemogram.13.2% patients had anemia. In PSA evaluation, maximum (81.2%) patients were found to have within normal limits of PSA (1-5 ng/mL) followed by 10% had 6-10 ng/mL. 7.2% patients had 11-50 ng/mL and only 1.6% patients had PSA more than 50 ng/mL. Alkaline Phosphatase level was 1-5 IU/L in 82.4% patients followed by 16-30 IU/L in 13.2% cases, 31-45 IU/L in 2.8% cases and more than 45 IU/L in 1.6% of cases. Median PSA level in histopathologically proved cases of carcinoma prostate was found to 60.5% ng/mL in 4.44% of patients and according to gleason grade PSA level was the 40.9% ng/mL in 8.88% of cases.*
**Conclusion**: *The PSA test can detect high levels of PSA that may indicate the presence of prostate cancer. However, many other conditions, such as an enlarged or inflamed prostate, can also increase PSA levels. Therefore, determining what a high PSA score means can be complicated.*
**Keywords**: *PSA, BPH, Carcinoma, Histopathology, Serum Creatinine.*

## Introduction

Prostate-specific antigen (PSA) test measures the level of PSA in our blood. The prostate is a small gland that is part of a man's reproductive system. It is located below the bladder and makes a fluid that is part of semen. PSA is a substance made by the prostate. Men normally have low PSA levels in their blood. A high PSA level may be a sign of prostate cancer, the most common non-skin cancer affecting American men. But high PSA levels can also mean noncancerous prostate conditions, such as infection (prostatitis) or benign prostatic hyperplasia, a noncancerous enlargement of the prostate.

Prostate specific antigen (PSA) is a kallikrein like, serine protease. It is a single chain glycoprotein containing 7% carbohydrate by weight. It is produced primarily by epithelial cells of all types of prostatic tissues by normal, as well as malignant cells of the prostate gland.

In 1994, the FDA approved the use of PSA test in conjunction with

A digital rectal examination (DRE) to test asymptomatic men for prostatic cancer.

## Material and Methods

Present study was conducted in the Department of Pathology, Nalanda Medical College, Patna, with the help of Department of Microbiology, Biochemistry and Urology, during the period of June 2015 to May 2017. A total of 250 male patients, of different age groups, presents with various urological complain, attending in medical and surgical OPD were included in the study. All the demographic data were noted. After the diagnosis by PSA, 90 cases was operated and send for histopathological examination in our department. PSA evaluation was done by Chemiluminescens immunoassay (CLIA) methods by fully automated machine supplied by Roche pharma.

## Results

**Table- 1** Shows Age Distribution of Patients

| Age group of male Patient in years | Total No. of male patients included in the study | Percentage. |
|---|---|---|
| 40-50 | 48 | 19.2 |
| 51-60 | 86 | 34.4 |
| 61-75 | 92 | 36-8 |
| More than 75 | 250 | |

**Table-2** Shows Distribution of patients according to clinical Diagnosis

| Clinical Diagnosis of Patient | Total No. of Patients | Percentage. |
|---|---|---|
| Prostatitis | 56 | 22.4 |
| Benign Prostatic Hypertrophy (BPH) | 84 | 33.64 |
| Suspected cases | 48 | 19.2 |
| Ca prostate with nodal involvement | 59 | 23.6 |
| Ca prostate with distant metastasis | 03 | 1.2 |

**Table-3** Shows Hematological Parameter of Patients

| Hematological Parameter | Total No. of Patients | Percentage. |
|---|---|---|
| Normal Hemogram | 159 | 63.6 |
| Anemia | 33 | 13.2 |
| Leukocytosis | 58 | 23.2 |

**Table-4** Shows Prostate- specific Antigen (PSA) level in patient

| PSA Level in ng/mL | Total No. of Patients | Percentage. |
|---|---|---|
| 1-5 | 207 | 81.2 |
| 6-10 | 25 | 10 |
| 11-50 | 18 | 7.2 |
| More than 50 | 04 | 1.6 |
| Total patients | 250 | |

**Table-5** Shows Alkaline Phosphatase level

| Alkaline Phosphatase level in IU/L | Total No. of Patients | Percentage. |
|---|---|---|
| 5-15 | 206 | 82.4 |
| 16-30 | 33 | 13.2 |
| 31-45 | 07 | 2.8 |
| More than 45 | 04 | 1.6 |

**Table-6** Shows Blood Urea level

| Blood Urea level mg/dl | Total No. of Patients | Percentage. |
|---|---|---|
| 20-40 | 75 | 30 |
| 41-60 | 110 | 44 |

| | | |
|---|---|---|
| More than 60 | 65 | 26 |

**Table-7** Shows Serum Creatinine level

| Serum Creatinine Level mg/dl | Total No. of Patients | Percentage. |
|---|---|---|
| 0.5-1.5 | 108 | 43.2 |
| 1.6-2.5 | 102 | 40.8 |
| More than 2.5 | 40 | 16.8 |

**Table-8** Shows median PSA Level in Histopathologically proved cases of Carcinoma prostate (n=90).

| Ca prostate staging | PSA Level ng/mL | Total No. of Patients | Percentage |
|---|---|---|---|
| Stage-A | 10.15 | 06 | 6.66 |
| Stage-B | 13.2 | 42 | 46.66 |
| Stage-C | 42.7 | 38 | 42.22 |
| Stage-D | 60.5 | 04 | 4.44 |

**Table-9** Shows, Median PSA Level According to Gleason Grade, (n=90)

| Gleason Grade | PSA Level ng/mL | Total No. Patients | Percentage |
|---|---|---|---|
| 2-4 | 11.35 | 13 | 14.44 |
| 5-7 | 24.2 | 69 | 76.66 |
| 8-10 | 40.9 | 08 | 8.88 |

**Table-10** Shows Level of PSA in Follow up cases after surgical intervention and chemotherapy. (n=90)

| Stage | PSA Level ng/mL | | | |
|---|---|---|---|---|
| | Less than 5 | 5-10 | 11-40 | More than 40 |
| Stage A | 06 (100%) | - | - | - |
| Stage B | 36 (85.7%) | 04 (9.5%) | 02 (4.7%) | - |
| Stage C | 25 (65.7%) | 09 (23.6%) | 03 (7.8%) | 01 (2.6%) |
| Stage D | -- | 01 (25%) | 01 (25%) | 02 (50%) |

## Discussion

PSA is one of the tumor markers of diagnostic and prognostic significance. Along with digital rectal examination (DRE) and prostatic Ultrasonography PSA is being used to diagnose the early prostatic cancers. Again in histopathologically proved cases of Carcinoma Prostate PSA is being used to know the early metastasis and tumor recurrence.

Out of 90 cases 84 cases were proved to be Ca prostate histopathologically. Rest 6 case were diagnosed histopathologically as borderline cases.

Of these 84 cases, 04 got treated in CTRC, with different modalities (i.e. external beam Radiation, Hormonal) and their PSA Level have been measured after treatment and every three month as follow up.

The rising level of PSA than previous level is considered as recurrence or metastasis. Rest 80 cases were followed up in Urology OPD by doing PSA estimation for any recurrence.

In those cases which underwent manipulation of prostate (Massage of DRE) samples for PSA have been taken after 36 hours to alleviate the false rising level of PSA.

These finding indicate that 85.7% cases in stage B and 65.7% cases in stage C are showing good response. 14.2% cases in stage B had recurrence while 34% in stage C are still left with metastatic focus. In distant metastatic cases of stage D the PSA Level is decreasing with treatment due to decrease in tumor volume.

## Conclusion

Our studies show that PSA estimation is approximately 94% sensitive and specific in the diagnosis of Ca Prostate cases. It also shows that PSA has definite prognostic value also. As PSA estimation is easy to perform and non invasive technique, it can be adopted in all district hospital for diagnosis and prognosis of carcinoma prostate.

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