

IPP And PSA Density - New Reliable Indicators In Grey Zone Serum PSA(4 To 10 Ng/ml) To Reduce TRUS Biopsy Anxiety

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Abstract: The Prostate specific antigen is elevated in majority of prostate cancer patients. Its estimation in the blood is used as one of the diagnostics as well as prognostic tool. However, PSA level ranging from 4.0 to 10.0 ng/ml is an area of grey zone and of diagnostic uncertainty. Additional factors such as intravesical prostatic protrusion, PSA density can increase the detection rate of prostate cancer in these particular grey zone areas. In our study the predictive accuracy of IPP (≤ 7 mm) and PSAD (> 0.15) was higher than that of tPSA, indicating that IPP would be a valid predictor of PCa when the patient had the PSA of 4.0–10.0 ng/ml.

Keywords: prostate cancer, psa level, total psa, ipp, intravesical prostatic protrusion, psa density

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I. Introduction

The Prostate-specific antigen (PSA) level is largely used to diagnose prostate cancer (PCa) in last decades. Unfortunately, the serum PSA level is also raised in benign prostatic conditions, such as benign prostatic hyperplasia (BPH) and prostatitis. However, its **specificity is low** in patients with a PSA level ranging from 4.0 to 10.0 ng/ml. Intravesical prostatic protrusion (IPP) is a morphological change due to overgrowth of prostatic median lobe into the bladder. Degree of IPP: Grade 1 (IPP < 5 mm), Grade 2 (5 mm to 10 mm) and Grade 3 (IPP > 10 mm). IPP was positively correlated with PV, Pdet.max and BOOI, while it is negatively correlated with Qmax.

II. Aim of the study

This study aims to define the correlation between intravesical prostatic protrusion (IPP), PSA density and PSA to establish diagnosis of Prostatic Cancer

III. Methods and Materials

All cases presenting with LUTS were evaluated in our OPD, during OCT 2017 to SEP 2019 period at Stanley medical college Hospital and those cases with positive inclusion criteria were included in our study after institutional Ethical committee approval.

INCLUSION CRITERIA

- Age > 45 years
- Presence of IPP
- Serum PSA ranging from 4.0 to 10.0 ng/ml

EXCLUSION CRITERIA

- Age ≤ 45 Years Old,
- Previous Operation In Bladder, Prostate Or Urethra,
- Current History Of Acute Urinary Retention (AUR),
- Acute Prostatitis Or Prostatic Abscess,
- Urethral Stricture, Bladder Stone,

- Neurogenic Bladder Dysfunction,
- Chronic Urinary Tract Infection

DATA COLLECTION AND EVALUATION

→ According to the eligibility criteria, 51 patients were enrolled in this study. Eligible patients were recommended for transrectal ultrasonography (TRUS)-guided prostate biopsies after measuring total prostate volume (TPV) and IPP and serum PSA. Patients were divided into BPH group and PCa group based on the results of TRUS guided biopsy. IPP, TPV, PSA and PSAD in the two groups were analyzed. Their Sensitivity and specificity rate of different levels were respectively calculated to make sure the best cut-off point in the diagnosis of prostatic cancer.

STATISTICAL ANALYSIS:

Clinical data were statistically analyzed using SPSS version 21.0. All values are presented as mean ± standard deviation. Statistically significant- if *P*-value <0.05.

IV. Results:

In a total of 51 cases, there were 13 patients with PCa and 38 patients with BPH. The PCa positive rate was 25.4%. Among 51 patients, -IPP Grade I (18), Grade II (11) and Grade III (22) The IPP average value were 9.3±7.3mm in total patients, 6.6±5.0mm in PCa patients, and 11.5±8.4mm in BPH patients. Between PCa and BPH groups, there was statistical difference in IPP, PV and PSAD (*P* < 0.05)

If taking IPP 7.5mm as the cut-off point, PCa can be diagnosed with highest specificity and sensitivity. Among 25 patients whose IPP were less or equal to 7.5 millimeter there were 10 cases with prostatic cancer. The PCa positive rate was 40%, while there were only 3 patients of PCa with the PCa positive rate of 11.5% among 26 cases with IPP more than 7.5mm. The PCa positive rate in patients with IPP less or equal to 7.5mm was statistically different from that of patients with IPP more than 7.5mm. The best sensitivity on diagnosing PCa was 96.7% when **IPP was combined with PSAD for a parallel test**

V. Discussion

In the 51 patients with IPP less than 7.5mm and whose tPSA level ranging from 4.0 to 10.0 ng/ml, 13 patients were diagnosed as PCa. The diagnostic accuracy was 25.4 %, which was similar to other study [Catalona WJ et al]. In our study group, TPV and IPP of PCa patients were significantly lower than those of BPH patients while tPSA had no significant difference. This result indicated that the increase of PV and IPP may play an important role in elevation of tPSA ranging from 4.0 to 10.0 ng/ml. Hammerer et al. confirmed that most PSA leakage from the prostate into the serum comes from the TZ and BPH results almost exclusively from hyperplasia of the TZ. In our study the predictive accuracy of IPP (≤7mm) and PSAD (>0.15) was higher than that of tPSA, indicating that IPP would be a valid predictor of PCa when the patient had the PSA of 4.0–10.0 ng/ml.

VI. Conclusion

The diagnosis of PCa in patients with tPSA ranging from 4.0 to 10.0 ng/ml, a diagnostic 'grey zone'. IPP and PSAD will help deciding which group of patients in the grey zone need to be investigated with prostatic biopsy. Further studies are needed for a better conclusion.

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	BPH (n=38)		PCa (n=13)		P value
	mean	SD	mean	SD	
Age	68.2	8.6	71.2	7.6	0.091
tPSA	6.71	1.52	7.10	1.48	0.311
TPV	74.5	25.5	52.6	18.22	<0.001
IPP	11.5	8.4	6.6	5.0	0.005
PSAD	0.10	0.05	0.15	0.05	<0.001

Table 1: Results of Correlation Between Bph And Prostate Cancer

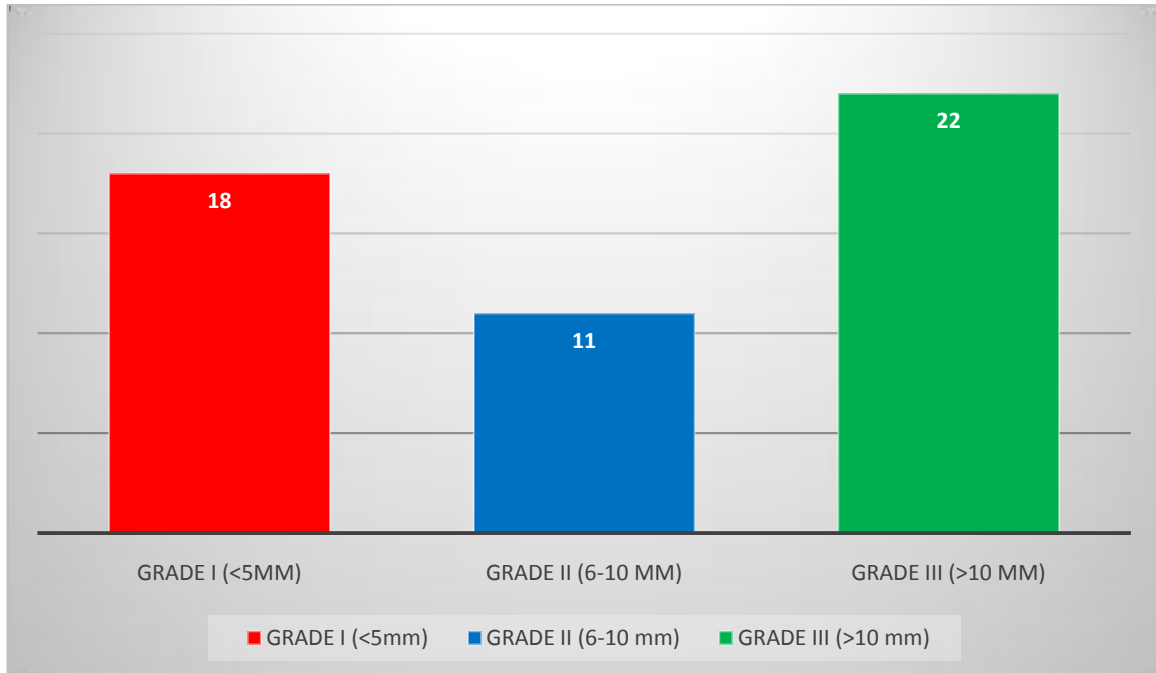


Fig 1: Grades of IPP in Our Study

	AGE	tPSA
Cap	71.2±7.6	7.1±1.48
BPH	68.2±8.6	6.71±1.52

TABLE 2: AGE DISTRIBUTION AND TOTAL PSA (MEAN)

IPP	CaP	BPH
≤7.5	10	15
>7.5	3	23

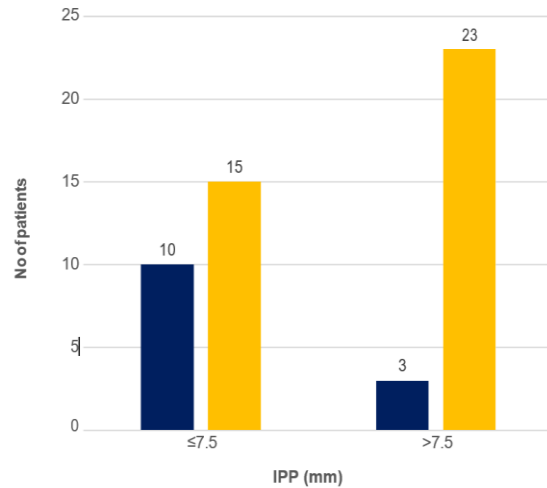


FIG 2: CORRELATION BETWEEN IPP IN CA PROSTATE AND BPH

	IPP(mm)	TPV(ml)	PSAD(ng/ml/cc)
CaP	6.6±5.0	52.6±18.22	0.15±0.05
BPH	11.5±8.4	74.5±25.5	0.1±0.05

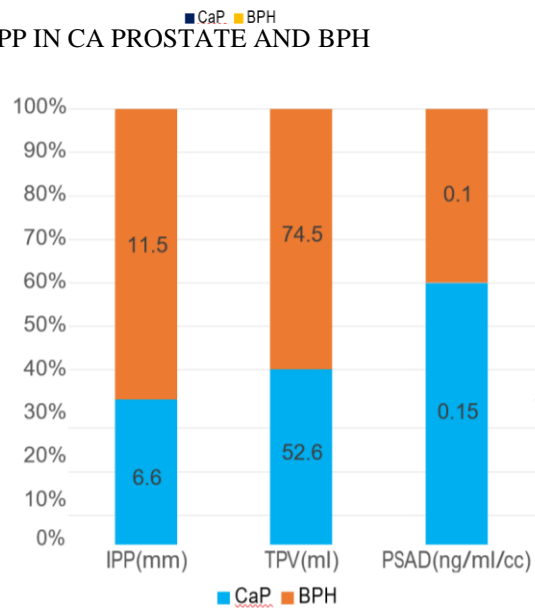


FIG 3: CORRELATION BETWEEN IPP, TPV AND PSAD IN OUR STUDY

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