INTERPRETATION OF PROSTATIC BIOPSY SPECIMEN WITH SERUM PSA LEVEL CORRELATION - A RETROSPECTIVE ANALYSIS IN A TERTIARY CARE HOSPITAL

ABSTRACT:

Introduction: The prostate is a pear-shaped glandular organ that adds part of fluid to semen. The prostate consists of stromal and glandular components. Prostate needle biopsy is performed either transrectal ultrasound (TRUS) guided or transurethral routes. PSA is a glycoprotein produced by secretory cells. Normally the PSA levels are less than 4.0ng/ml.

Aim: The main aim of the study is to find out the correlation between various pathological lesions occur in the prostate and serum Prostate Specific Antigen (PSA) level.

Study design: A retrospective study.

Place and duration of study: Department of Pathology,Saveetha Medical college and Hospital, between January 2019 and December 2019.

Methodology: A retrospective study of 84 prostatic biopsies for a period of 1 year in the year 2019 was carried out. All specimens subjected for histopathological examination and the relevant clinical data and Serum PSA values correlation was done.

Results: Commonest age group being 61-70 years. Difficulty in micturition was the most common presentation .Most common lesion found was Benign Prostatic Hypertrophy(BPH) constituting 67 cases (71.42%) followed by BPH with prostatitis 17 cases (20.23%), adenocarcinoma 6 cases (7.14%) and 1 case of Prostatic Intraepithelial Neoplasia(PIN) (1.19%). BPH patients, had S.PSA levels in the range of 4.1-15 ng/ml. Three cases of adenocarcinoma showed very high levels of S.PSA (>100 ng/ml) with the Gleason score of 9(5+4).

Conclusion: Both benign and malignant pathologies can cause an increase in serum PSA levels, but the chances of finding malignancy increases with rising values of PSA. But in the management of prostatic cancerthe histopathological diagnosis and grading plays a definitive role.

Key words: Prostate, Lesions, Histopathology, Serum prostate-specific antigen.

INTRODUCTION:

The prostate is a pear-shaped glandular organ that adds part of fluid to semen and weighs up to 20 gm in normal adult male. It has been divided into peripheral, central, transitional, and periurethral gland regions. The urothelial and periurethral regions are the exclusive sites of origin of nodular hyperplasia, whereas the peripheral zone is the one most susceptible to prostatitis and carcinoma. The prostate is enveloped by a fibromuscular layer usually referred to as a capsule.The prostate consists of stromal and glandular components [1].Smooth muscle cells; fibroblasts and endothelial cells are in the stroma. The glandular component is composed of acini and ducts. The secretory cells, which are located in the luminal side of the gland, produce prostatic acid phosphatase (PAP) and prostate-specific antigen (PSA), both of which can be readily identified immunohistochemically and have been proved of great diagnostic utility because of their organ-related specificity. PSA is a glycoprotein that has been identified as a kallikrein-like protease. Normally the PSA levels are less than 4.0ng/ml.Prostate needle biopsy is performed either transrectal ultrasound (TRUS) guided or transurethral routes. Needle biopsy of the prostate plays a central role in the evaluation of prostate cancer. The main aim of the study is to find out the correlation between various pathological lesions occur in the prostate and serum PSA level.

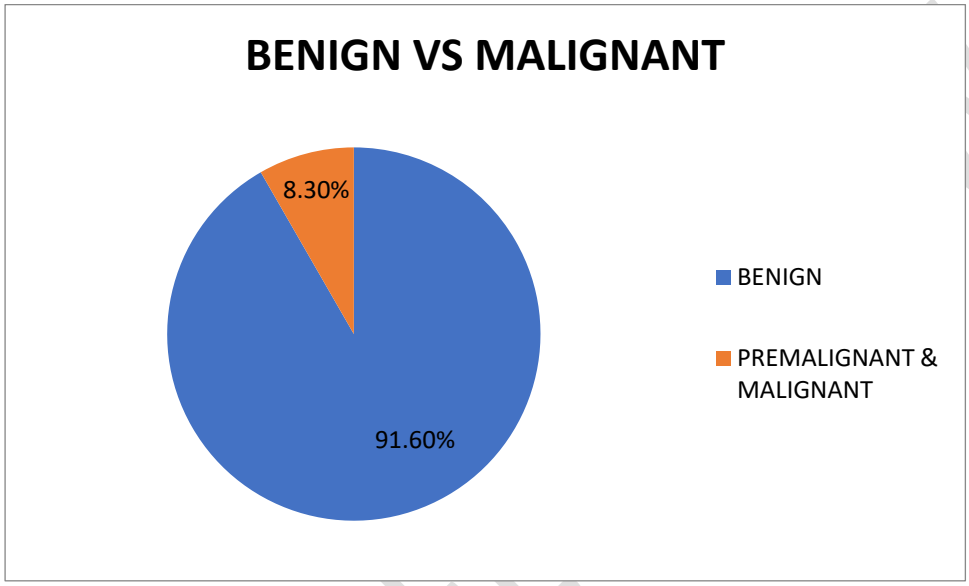
MATERIALS AND METHODS:

This is a retrospective study carried out in the Department of Pathology.Eighty four (84) prostatic biopsies received during the period of Jan 2019 and Dec 2019 were included in the present study. The biopsy material included transuretheral resection of prostate (TURP) specimens, TRUS guided needle biopsies. There were 48 TURP specimens and 36 TRUS biopsy specimens and they were fixed in 10% neutral buffered formalin and sections were stained with hematoxylin and eosin stain (H & E) stain. Relevant clinical data including age, the presenting complaints and Serum PSA values in selected biopsy cases were recorded. Serum PSA levels were estimated using chemiluminescent assay.Among 84 cases, Serum PSA level was done in 58 cases and thus correlation of prostatic lesion with the serum PSA was carried out in those 58 cases.

RESULTS:

Total 84 prostate biopsy specimens were studied over a period of one yearshowed 91.6% of the cases as benign while 8.3% of cases were premalignant and malignant as shown in Chart 1.

Chart 1: Benign vs malignant lesions:



In this study, we found prostatic lesions were mostly associated within the age group of 61–70 years (38%) as shown in Table 1. The mean age of patients with prostatic disorders was 66years and the median age noted was 65years.

Table 1: Age distribution:

Age	Number of cases (total cases 84)	%
50-60	21	25
61-70	32	38
71-80	22	26
>80	9	11

Difficulty in micturition was the most common presentation (64 cases) followed by frequency of micturition (20 cases).

BPH was the most common prostatic disorder encountered presenting in 60 cases (71.42 %) as depicted in Table 2. Majority of them showed glandulo stromal proliferation as shown in Fig 1. 17(20.23%) cases of BPH showed features of associated chronic prostatitis. In that Granulomas were present in three cases and reported as granulomatous prostatitis for which AFB stain was performed and it was found to be negative.

Table 2: Histopathological spectrum of lesions:

Histopathological spectrum of lesions	Number of cases	%
BENIGN PROSTATIC HYPERPLASIA(BPH)	60	71.42
BPH WITH PROSTATITIS	17	20.23
ADENO CARCINOMA	6	7.14
PROSTATIC INTRAEPITHELIAL NEOPLASIA	1	1.19

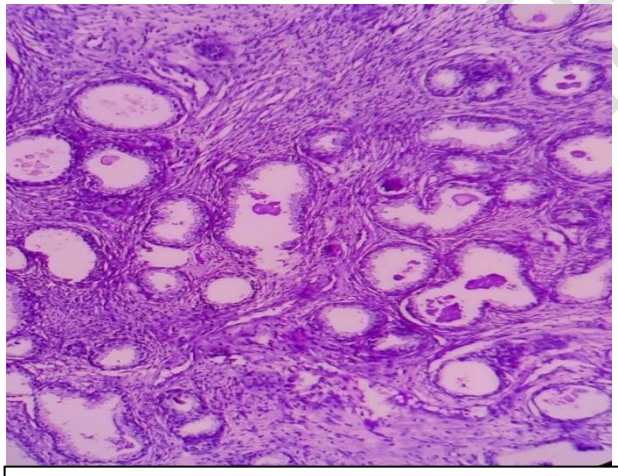


Fig 1 (H&E- 10X) Benign prostatic hyperplasia

Other lesions encountered were 6 cases (7.14%) of adenocarcinoma and one case (1.19%) of High grade Prostatic intraepithelial neoplasia (PIN) as depicted in Fig 2&3.

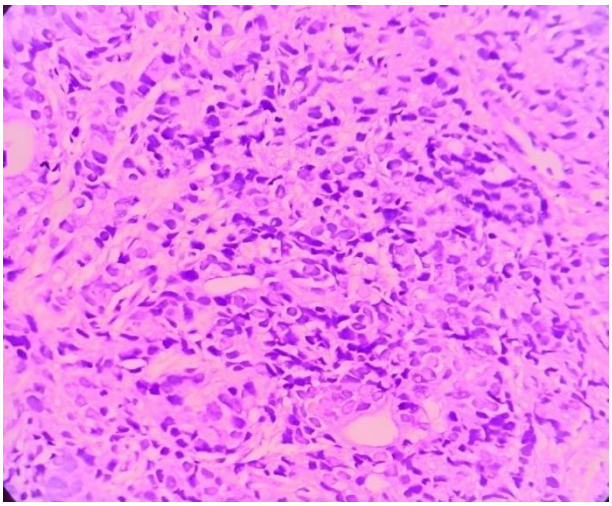


Fig 2 (H&E- 40X) Adenocarcinoma –Gleasons score 9(4+5)

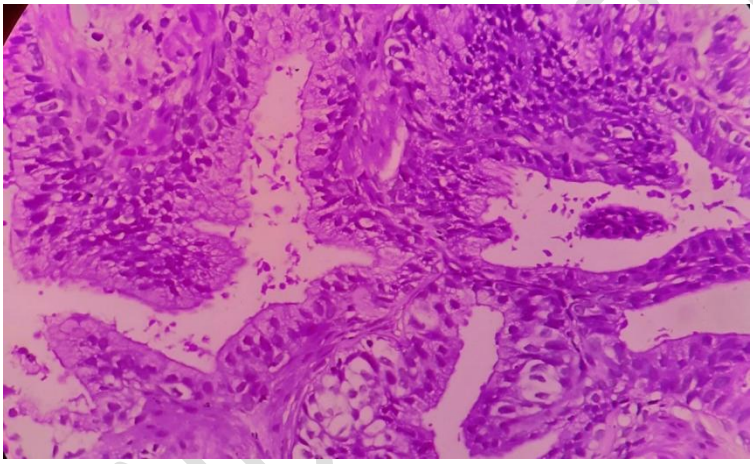
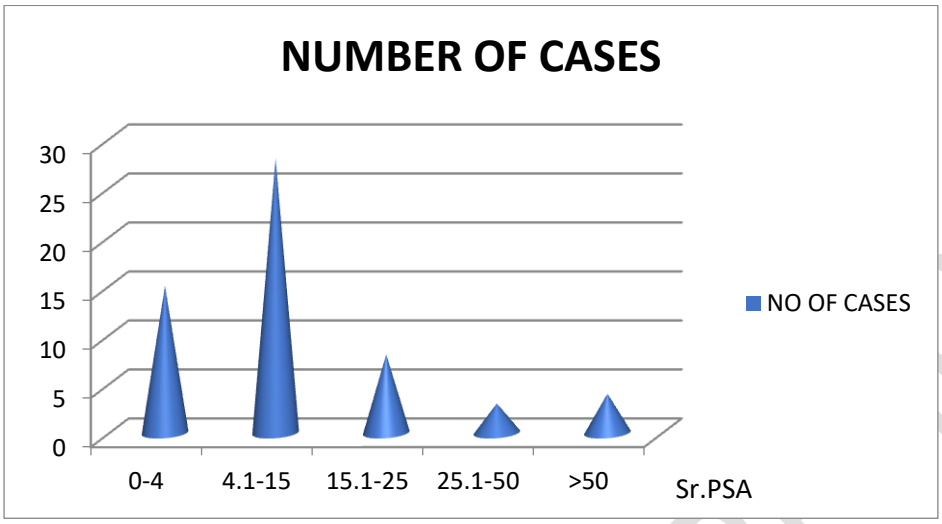


Fig 3 (H&E- 40X) High grade PIN

Among 84 cases, Serum PSA level was done in 58 cases and thus correlation of prostatic lesion with the serum PSA was carried out in those 58 cases as shown in Chart 2.

Chart 2: Serum PSA level



Among the BPH patients, S.PSA levels were available in 36 cases, out of which 20 cases had S.PSA levels in the range of 4.1-15 ng/ml. 12 cases showed normal PSA level. 3 cases showed PSA value between 15.1-25ng/ml. The highest value of serumPSA noted among the BPH patients was 25.1 ng/ml. Out of 17 cases of BPH with prostatitis 11 showed PSA level of 4.1- 15. The highest value of serum PSA was 50.1and lowest value was 4.7ng/ml. One case of high grade PIN has PSA level of 24.1ng/dl. Among the Adenocarcinoma patients, S.PSA levels were available in 4 cases.

Three cases of adenocarcinoma showed very high levels of S.PSA (>100 ng/ml) as shown in Table 3 and one case showed normal PSA level.In the present study there were 3 cases of adenocarcinoma with gleason score was 9(4+5) and 3 cases of Adenocarcinoma of prostate with Gleason score 7(4+3).

Table 3: Prostatic disorders & PSA levels:

PSA	BPH	BPH with Prostatitis	Adenocarcinoma	PIN	No of Cases
0-4	12	1	1	-	15
4.1-15	20	11	-	-	31
15.1-25	3	3	-	1	7
25.1-50	1	1	-	-	2
>50	-	1	3	-	4
Total	36	17	4	1	58

DISCUSSION:

In this study most of the lesions found to be benign (91.6%) when compared to premalignant and malignant lesions. It was similar to a recent study [2] included TURP (88.70%) and needle biopsy specimens (11.30%) and they found that the benign lesions constituting 80.6% and Premalignant and malignant lesions constituted 19.4%

We found prostatic lesions were mostly occurring in the sixth decade. The mean age of patients with prostatic disorders in our study was 66years and the median age noted was 65years. Many studies [3, 4, 5] conducted on prostatic lesions have similar findings.

Difficulty in micturition was the most common presentation (64 cases). Many studies [5, 6] conducted on prostatic lesions also showed urinary obstructive symptoms were the major presenting symptoms and signs.

In histopathological examination, BPH (71.42%) was the most common prostatic disorder encountered in our stiudy. In which 20% cases of BPH showed features of associated chronic prostatitis. Other lesions encountered were adenocarcinoma (7.14%) and one case of High grade Prostatic intraepithelial neoplasia (PIN). This is in accordance with various other studies.[7,8,9,10,11]

Correlation of prostatic lesion with the serum PSA was carried out in those 58 cases. Most of the BPH cases and BPH with prostatitis have PSA levels in the range of 4.1-15 ng/ml. The highest value noted in BPH and BPH with prostatitis was 25.1 and 50.1 respectively.

One case of high grade PIN has PSA level of 24.1ng/dl. Three cases of adenocarcinoma showed very high levels of S.PSA (>100 ng/ml) and one case showed normal PSA level.In the present study there were 3 cases of adenocarcinoma with Gleason score was 9(4+5) and 3 cases of Adenocarcinoma of prostate with Gleason score 7(4+3). These results were nearlycomparablewith the studies previously conducted [4, 12, 13].

CONCLUSION:

The most common pathological finding encountered in prostaticbiopsies is BPH. Most of the diseases of prostate occur in the age group of 61–70 years. Both benign and malignant lesions of prostate can cause an increase in serum PSA levels, but the chances of finding malignancy increases with rising values of PSA. But in the management of prostatic cancerthe histopathological diagnosis and grading plays a definitive role.

ETHICAL APPROVAL:

All authors hereby declare that ethical approval was obtained from the Institutional Review Board.

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