e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2026; 18(1); 1423-1426

Original Research Article

Histopathological Patterns of Prostatic Lesions with Serum PSA Correlation

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Received: 28-11-2025 / Revised: 27-12-2025 / Accepted: 29-01-2026
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Conflict of interest: Nil

Abstract:

Background: Malignant neoplasms and benign inflammatory diseases are both examples of prostate lesions. PSA, or serum prostate-specific antigen, is frequently used as a diagnostic and screening tool. The accuracy of diagnosis is improved when serum PSA levels and histopathological findings are correlated.

Aim: To compare serum PSA levels with the histological spectrum of prostatic lesions.

Methods: 110 prostate specimens that were received by the Department of Pathology were included in a one-year retrospective research. Records were searched for clinical information, serum PSA levels, and histopathological results. Among the specimens were samples from prostatectomy, needle biopsies, and transurethral resection of the prostate (TURP). Analysis was done on the statistical relationship between PSA levels and histological diagnosis.

Results: The largest age group among 110 cases was 60–69 years old (43.6%). The most prevalent lesion (58.1%) was benign prostatic hyperplasia (BPH). A significant correlation ($p<0.001$) was seen between elevated PSA (>10 ng/mL) and cancer. The highest mean PSA values were found in cases of carcinoma (32.3 ng/mL), prostatitis (14.3 ng/mL), and BPH (6.6 ng/mL).

Conclusion: The most prevalent prostatic lesion is still BPH. Nonetheless, there is a clear correlation between malignant tumors and noticeably high PSA readings. The most reliable method for making a conclusive diagnosis is still histopathological analysis.

Keywords: Prostate, PSA, BPH, Prostatic carcinoma, Histopathology.

DOI: 10.25258/ijcpr.18.1.242

Introduction

One of the most prevalent disorders affecting older men is prostate disease. Prostate cancer, premalignant lesions, prostatitis, and benign prostatic hyperplasia (BPH) are all included in the spectrum [1]. One of the most common malignancies in males worldwide is prostate cancer. Prostate cancer is a major worldwide health burden, according to the World Health Organization [2].

Prostate disorders are frequently detected and tracked using serum prostate-specific antigen (PSA), a glycoprotein released by prostatic epithelial cells [3]. However, benign illnesses like prostatitis and BPH can also cause elevated PSA readings, which lowers specificity [4].

Histopathological analysis is still the gold standard for diagnosis. In order to improve clinical interpretation and management, serum PSA levels and histopathological findings are correlated [5].

Materials and Methods

Study Design: Retrospective observational study.

Study Period: One year.

Study Sample: 110 prostatic specimens received in the pathology department.

Inclusion Criteria

- All prostatic specimens (TURP, needle biopsy, prostatectomy)
- Available preoperative serum PSA values

Exclusion Criteria

- Inadequate biopsy material
- Missing PSA data

Data Collection

- Age
- Clinical presentation
- Serum PSA level (ng/mL)

- Histopathological diagnosis

PSA Categorization

- <4 ng/mL
- 4–10 ng/mL
- 10 ng/mL

Statistical Analysis: Descriptive statistics were used for data analysis. The chi-square test was used to evaluate the relationship between PSA and histopathology ($p<0.05$ was deemed significant).

Results

Table 1: Age Distribution

Age Group (Years)	Number of Cases	Percentage (%)
40–49	9	8.1%
50–59	20	18.1%
60–69	48	43.6%
70–79	26	23.6%
≥80	7	6.3%

Majority of cases were in 60–69 years.

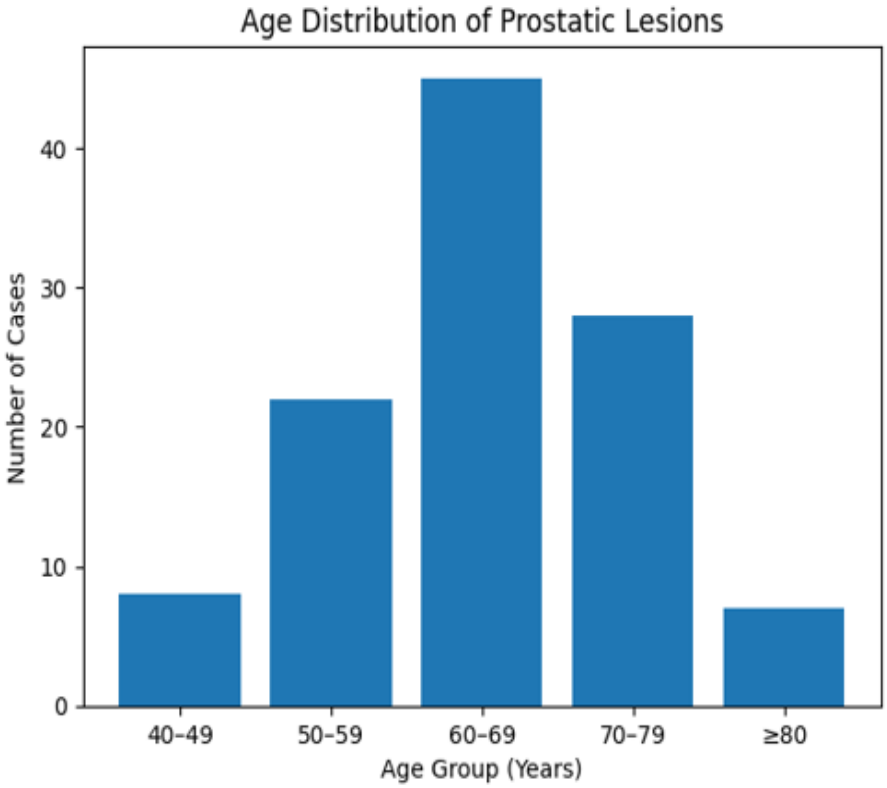

Figure 1: Age-distribution of prostatic lesions

Table 2: Histopathological Spectrum

Diagnosis	Number	Percentage (%)
Benign Prostatic Hyperplasia (BPH)	64	58.1%
BPH with Prostatitis	13	11.8%
Chronic Prostatitis	8	7.2%
Prostatic Adenocarcinoma	25	22.7%
Total	110	100%

Table 3: PSA Distribution

PSA Level (ng/mL)	BPH	Prostatitis	Carcinoma	Total
<4	19	2	0	21
4–10	35	9	3	47
>10	14	8	22	44

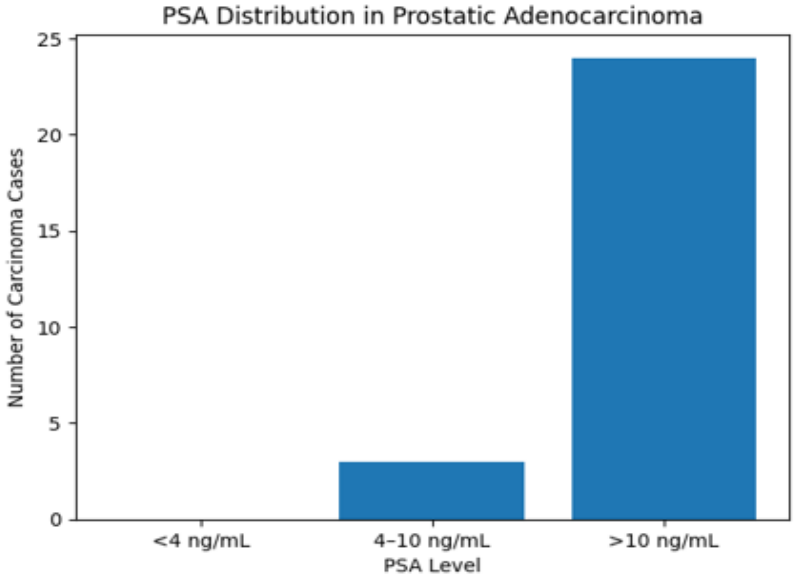

Figure 2: PSA distribution in prostatic adenocarcinoma

Table 4: Mean PSA Levels

Lesion Type	Mean PSA (ng/mL)
BPH	6.6
Prostatitis	14.3
Adenocarcinoma	32.3

Chi-square test showed significant association between PSA >10 ng/mL and carcinoma ($p<0.001$).

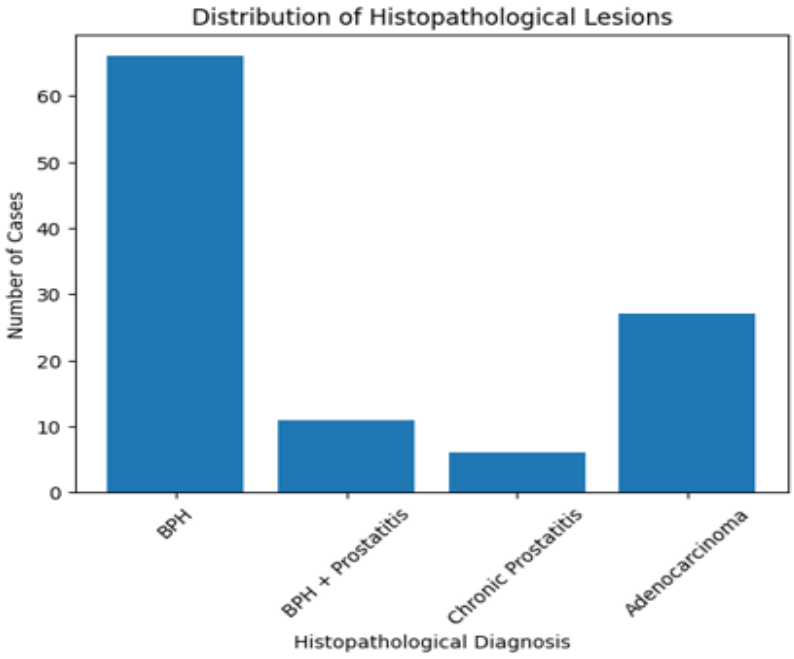

Figure 3: Distribution of histopathological lesions

Discussion

In line with a number of Indian and foreign research, BPH was the most prevalent prostatic lesion in this study (58.1%). Due to age-related prostatic hypertrophy, the majority of patients were in their sixth and seventh decades. 22.7% of cases were cancer, and the majority of patients had PSA values greater than 10 ng/mL. The diagnostic efficacy of PSA was supported by the substantial correlation between elevated PSA values and cancer [6]. However, inflammatory lesions also showed higher PSA levels, suggesting inadequate specificity. PSA levels were somewhat elevated in chronic prostatitis

because to glandular inflammation and epithelial integrity damage [7].

The best standard for diagnosis is still histopathology, especially when there is overlap between benign and malignant diseases and the PSA value is borderline (4–10 ng/mL).

The results are in line with worldwide observations that tissue inspection is necessary for a conclusive diagnosis even though PSA is a helpful screening tool [8,9].

Conclusion

The most frequent prostatic lesion seen in clinical practice is benign prostatic hyperplasia (BPH). On the other hand, significantly higher serum PSA levels especially those above 10 ng/mL are linked to prostatic cancer. PSA does not, however, have total specificity because there is diagnostic overlap because increased levels can also be seen in inflammatory disorders such prostatitis. As a result, the most reliable method for conclusively diagnosing prostatic lesions is still histological analysis. Correct patient treatment is made easier and diagnostic accuracy is increased when serum PSA levels and histopathological findings are interpreted together.

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