Examining the Relationship between PSA Levels and Prostate Cancer in Patients Referring to Urology Clinic from 2014 to 2023

Abstract

Background: Prostate cancer is the second most common neoplasm and the fifth most invasive cancer among men worldwide, with approximately 1.4 million new cases diagnosed yearly. The incidence and mortality of prostate cancer are associated with increasing age, with an average age at diagnosis of 66 years. Prostate cancer may be asymptomatic in its early stages and often has a latent period. The use of the PSA index in the definitive diagnosis of prostate cancer is still challenging for many urologists, and research in this area can help better to understand the precise relationship between PSA and prostate cancer.

Aim: This study aimed to investigate the relationship between PSA levels and prostate cancer in patients referring to the urology clinic from 2014 to 20123 to improve diagnosis, develop effective treatments, and improve clinical outcomes.

Materials and Methods: In this cross-sectional study, 242 patients with prostate cancer referred to a urology surgical clinic over nine years from 2014 to 2023 were included and divided into two groups based on the duration of disease diagnosis, the youngest and oldest age groups. Demographic and clinical laboratory data were collected and entered into a checklist, and then patients underwent a biopsy, and the results were recorded. After completion of the study, the obtained data were entered into the SPSS software and subjected to statistical analysis. Moreover, multiple regression was used for correlation tests, and nonparametric tests such as Kruskal-Wallis or Mann-Whitney U test were used for analyzing nonparametric data.

Results: This study included 242 out of 276 samples for analysis. The minimum age of inclusion was 41 years, and the maximum was 90 years, with a mean age of 67 ± 9.42 years. According to the data, at PSA concentrations of 4-10, 5% of the samples were healthy, 15.2% had cancer, 46% had BPH, and 33% had PIN. At PSA concentrations of 10-50, 6% of the samples were healthy, 37% had cancer, 26% had BPH, and 29% had PIN. At PSA concentrations greater than 50, 3% of the samples were healthy, 76% had cancer, 14% had BPH, and 7% had PIN. Based on the chi-square test, there was a significant association between PSA levels and pathological response ($P<0.001$). Also, based on the analysis of variance (ANOVA) test, there was a significant difference between different age and severity groups ($P<0.001$). The free PSA to Total PSA ratio in this study was 0.18, and the PSA to prostate volume ratio was 0.15, which were significantly associated with biopsy results ($P<0.01$).

Conclusion: Overall, the data from this study showed that plasma PSA levels are directly associated with the likelihood of prostate cancer. Additionally, the results demonstrated that

plasma PSA levels, while directly associated with age, can be directly related to the severity of trophic disorders such as cancer on biopsy results.