

Evaluating the Prognostic and Therapeutic Significance of PSA in Prostate Cancer

Vijaya Marakala, MD* Asila Mansoor Alhinai**, Taqwa Ahmed Alnaabi**, Sulaiman Khan**, Asmaa Mubarak Khamis Almashiki**, Salima Al Maqbali, MD*** Elham Said Ahmed Al Risi, MD**** Gulam Saidunnisa Begum, MD***** Anshoo Agarwal***** Nida Suhail***** Muhammad Jan***** Rashad Qasem Ali Othman*****

ABSTRACT

Prostate cancer (PCa) remains one of the most prevalent malignancies in men and a leading cause of cancer-related mortality worldwide. Despite diagnostic advances, disparities in outcomes persist, particularly in resource-limited settings. This study aimed to evaluate the prognostic utility of prostate-specific antigen (PSA) dynamics and key clinical parameters, including complications and Gleason score, in predicting disease progression and mortality among PCa patients in Oman. A retrospective cohort study was conducted at a tertiary care center in Sohar hospital, Oman, involving 20 histologically confirmed PCa patients treated between 2019 and 2024. Data collected included baseline and follow-up PSA levels, Gleason scores, TNM staging, treatment modalities, treatment-related complications, and survival outcomes. Patients were stratified by disease progression and survival status. PSA levels during follow-up, presence of complications, and disease progression were significantly associated with mortality. In the multivariate Cox model, complications (HR = 0.091, 95% CI: 0.010–0.821, $p = 0.033$), follow-up PSA levels (HR = 0.988, 95% CI: 0.977–0.999, $p = 0.039$), and disease progression (HR = 0.089, 95% CI: 0.009–0.900, $p = 0.040$) emerged as independent predictors of decreased survival. Gleason scores were significantly higher among deceased patients, though not significant after adjustment. Unexpectedly, younger age was associated with increased mortality risk. Follow-up PSA levels, complication status, and disease progression provide clinically relevant prognostic information in prostate cancer patients. These findings support the use of dynamic PSA monitoring and individualized follow-up strategies to improve clinical decision-making, particularly in resource-constrained settings.

Keywords: prostate specific antigen; prostate cancer; survival analysis; gleason score; cox proportional hazards model

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- * Associate Professor, Department of Biochemistry
College of Medicine and Health Sciences
National University of Science and Technology
Sohar, Oman.
- ** Medical Student, Year 5, College of Medicine and Health Sciences
National University of Science and Technology
Sohar, Oman.
- *** Consultant Chemical Pathologist
Head Department of Pathology and Blood bank
Sohar hospital, Ministry of Health
Sohar, Oman.
- **** Senior Specialist, Chemical Pathologist
Department of Pathology, Sohar Hospital
Ministry of Health, Sohar, Oman.
- ***** Professor and Head, Department of Biochemistry
College of Medicine and Health Sciences
National University of Science and Technology, Sohar, Oman.
- ***** Professor, Pathology Department, Faculty of Medicine
Northern Border University, Arar, Saudi Arabia.
- ***** Associate Professor, Department of Medical Laboratory Technology
Faculty of Applied Medical Sciences
Northern Border University, Arar, Saudi Arabia.
Email: nsuhail123@gmail.com
- ***** Professor, Pharmacology Department
Faculty of Medicine, Northern Border University
Arar, Saudi Arabia.
- ***** Assistant Professor, Pathology Department
Faculty of Medicine, Northern Border University
Arar, Saudi Arabia.