Prognostic accuracy of Prostate Health Index and urinary Prostate Cancer Antigen 3 in predicting pathologic features after radical prostatectomy.

Cantiello F[1], Russo GI[2], Ferro M[3], Cicione A[4], Cimino S[2], Favilla V[2], Perdonà S[5], Bottero D[3], Terracciano D[6], De Cobelli O[3], Morgia G[2], Damiano R[4].
Author information

- [1]Urology Unit, Magna Graecia University of Catanzaro, Catanzaro, Italy; Doctorate Research Program, Magna Graecia University of Catanzaro, Catanzaro, Italy. Electronic address: cantiello@unicz.it.
- [2]Urology Unit, Department of Surgery, University of Catania, Catania, Italy.
- [3]Department of Urology, European Institute of Oncology, Milan, Italy.
- [4]Urology Unit, Magna Graecia University of Catanzaro, Catanzaro, Italy; Doctorate Research Program, Magna Graecia University of Catanzaro, Catanzaro, Italy.
- [5]Department of Urology, National Cancer Institute of Naples, Naples, Italy.
- [6]Department of Translational Medical Sciences, Federico II University of Naples, Naples, Italy.

Abstract

OBJECTIVE:
To compare the prognostic accuracy of Prostate Health Index (PHI) and Prostate Cancer Antigen 3 in predicting pathologic features in a cohort of patients who underwent radical prostatectomy (RP) for prostate cancer (PCa).

METHODS AND MATERIALS:
We evaluated 156 patients with biopsy-proven, clinically localized PCa who underwent RP between January 2013 and December 2013 at 2 tertiary care institutions. Blood and urinary specimens were collected before initial prostate biopsy for [-2] pro-prostate-specific antigen (PSA), its derivates, and PCA3 measurements. Univariate and multivariate logistic regression analyses were carried out to determine the variables that were potentially predictive of tumor volume >0.5ml, pathologic Gleason sum≥7, pathologically confirmed significant PCa, extracapsular extension, and seminal vesicles invasions.

RESULTS:
On multivariate analyses and after bootstrapping with 1,000 resampled data, the inclusion of PHIsignificantly increased the accuracy of a baseline multivariate model, which included patient age, total PSA, free PSA, rate of positive cores, clinical stage, prostate volume, body mass index, and biopsy Gleason score (GS), in predicting the study outcomes. Particularly, to predict tumor volume>0.5, the addition of PHI to the baseline model significantly increased predictive accuracy by 7.9% (area under the receiver operating characteristics curve [AUC] = 89.3 vs. 97.2, P>0.05), whereas PCA3 did not lead to a significant increase. Although both PHI and PCA3 significantly improved predictive accuracy to predict extracapsular extension compared with the baseline model, achieving independent predictor status (all P′s<0.01), only PHI led to a significant improvement in the prediction of seminal vesicles invasions (AUC = 92.2, P<0.05 with a gain of 3.6%). In the subset of patients with GS≤6, PHIsignificantly improved predictive accuracy by 7.6% compared with the baseline model (AUC = 89.7 vs. 97.3) to predict pathologically confirmed significant PCa and by 5.9% compared with the baseline model (AUC = 83.1 vs. 89.0) to predict pathologic GS≥7. For these outcomes, PCA3 did not add incremental predictive value.

CONCLUSIONS:
In a cohort of patients who underwent RP, PHI is significantly better than PCA3 in the ability to predict the presence of both more aggressive and extended PCa.

KEYWORDS:

Active surveillance; PCA3; PHI; Prognostic accuracy; Prostate cancer; Radical prostatectomy