The Utility of Serum Biomarkers for Predicting Cancer in Patients with a Previous Negative Prostate Biopsy

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Objectives

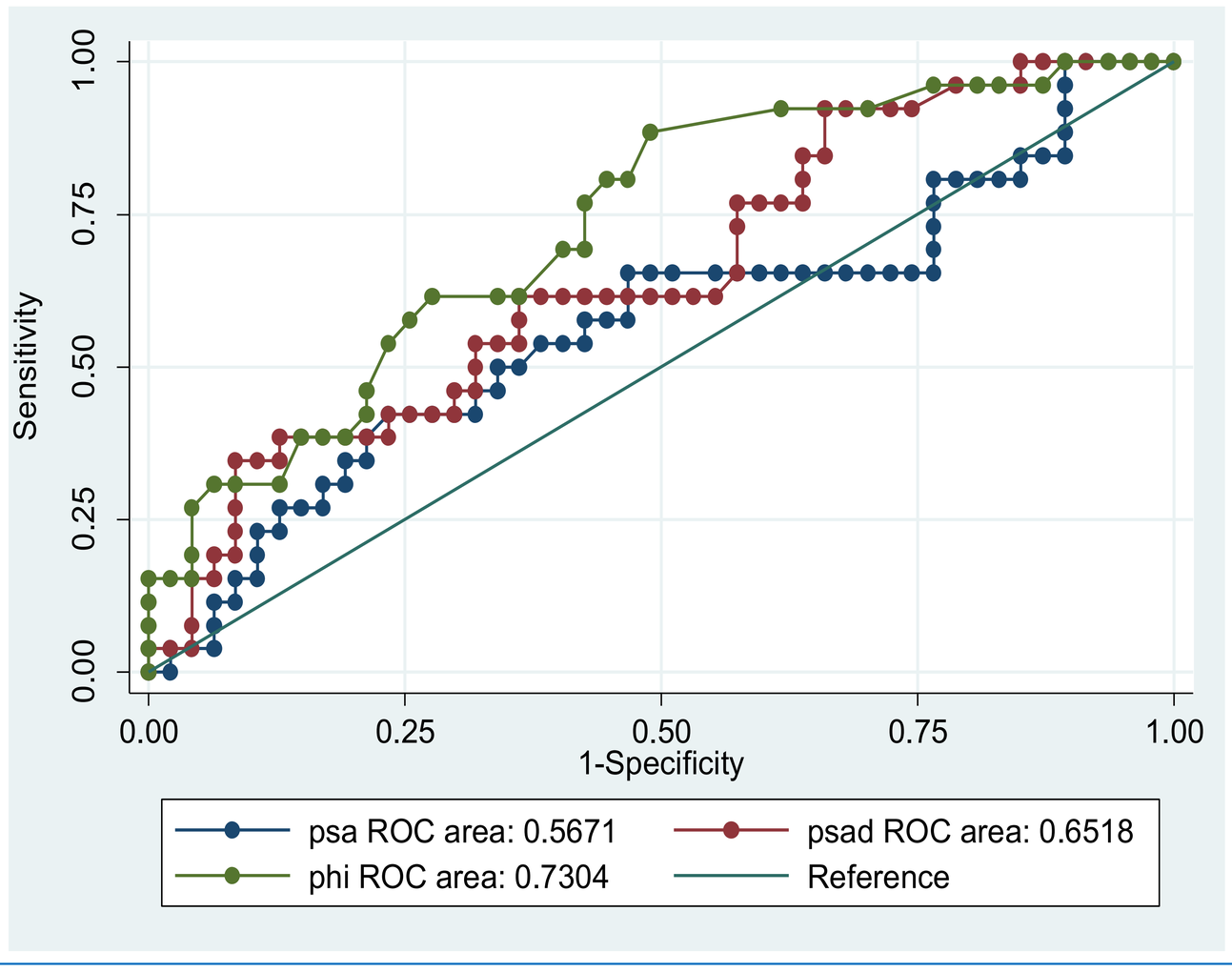
- There is a significant number of men who have prostate cancer (PCa) despite a prior negative prostate biopsy
- Use of ancillary markers such prostate-specific antigen (PSA), PSA density (PSAD) and prostate health index (PHI) have been suggested for usage in patients with negative or low suspicion lesions (Prostate Imaging-Reporting and Data System) [PIRADS] <3 to identify patients warranting repeat biopsy
- However, there are no current consensus regarding optimal management for men[1] with persistent clinical suspicion of PCa (PSA > 4 or PIRADS ≥ 3) despite previous negative biopsy [2,3]
- Multiparametric magnetic resonance imaging (mpMRI) has been employed, but is an expensive resource and prostate biopsy also has its limitations and complications [4]
- **Objective:** To evaluate the utility of serum biomarkers such as prostate-specific antigen (PSA), PSA density (PSAD) and prostate health index (PHI) in patients with previous negative biopsy (PNB)

Methods

- Single centre, prospective, observational study
- All patients between Sep 2015– Oct 2020 who underwent saturation and/or targeted biopsy
- PSA, PHI and PSA density were taken prior to biopsies
- Primary outcome : Histopathological PCa, clinically significant PCa (defined as Gleason score ≥ 7)
- Secondary outcome : Lesion characteristics on mpMRI, PIRADS classification
- Data & statistics: Sensitivity, specificity, Area Under Curve (AUC) and Receiver Operating Curves (ROC) for each of the biomarkers were calculated

Results

- Out of 351 patients who underwent a saturation biopsy with or without targeted biopsies, 103 patients had a previous negative biopsy
- The PNB group comprised 15 patients with a negative MRI scan, 61 patients had one lesion on MRI, 16 had 2 lesions, 7 had 3 lesions, 3 had 4 lesions and 1 patient had 5 lesions
- Of the index lesions, 35 were PIRADS 3, 40 were PIRADS 4 and 12 was PIRADS 5
- 60 patients had histopathologically diagnosed PCa whilst 41 patients had clinically significant PCa



- In the PNB cohort, PHI had the best ability to predict for clinically significant PCa with an Area Under Curve (AUC) of 0.73 (CI 0.61-0.85) compared to 0.65 (CI 0.52-0.78) for PSAD and 0.57 for PSA (CI 0.42-0.71)
- With a cut off value of 35, PHI was able to predict for clinically significant PCa for patients with previous PNB, with a sensitivity level of 88.5% and specificity of 51.1%

Figure 1. Clinically significant prostate cancer AUC for PHI, PSA, PSAD in the PNB cohort

CONCLUSION

PHI may help to predict for clinically significant PCa in patients with previous negative biopsy, and aid in reducing the number of patients requiring unnecessary prostate biopsies

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