

The Performance of mpMRI and the 4Kscore for Predicting Progression on Active Surveillance; Results from a Single Institution Prospective Study

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Introduction: While active surveillance has increased, patient selection and misclassification remain an issue. We evaluate the role of mpMRI and the 4Kscore in predicting prostate cancer progression at confirmatory biopsy in men who were enrolled on a prospective active surveillance trial.

Specific Aims: To determine the sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) if 4Kscore or mpMRI for predicting cancer progression on confirmatory biopsy. To compare the predictive capability of each test against each other and when used together.

Methods: Men with very low to intermediate risk prostate cancer were enrolled on a prospective surveillance protocol in which they underwent mpMRI and 4Kscore prior to undergoing MRI guided and template biopsy of the prostate. We considered a 4Kscore of 7.5% or higher and an mpMRI of PIRADS 4 or 5 to be considered positive tests. We calculated the sensitivity, specificity, positive PPV and NPV for predicting cancer progression on confirmatory biopsy. We compared estimates between 4Kscore and mpMRI and when between using either test alone versus both together.

Results: Among the 208 men who were enrolled on the trial and underwent confirmatory biopsy within 18 months, 164 consented to provide blood and make up the current study cohort.. We found that adding a 4Kscore to an mpMRI improved the sensitivity for predicting progression (97.7% vs. 79.1%, $p<0.01$), however adding an mpMRI to a 4Kscore did not (97.7% vs. 93%, $p=0.16$). mpMRI had a higher specificity than the 4Kscore for predicting progression (57.9% vs. 19%, $p<0.01$). While the 4Kscore had a higher sensitivity for predicting progression compared to mpMRI, this did not reach statistical significance (93% vs. 79.1%, $p=0.06$). We found no difference in the NPV for predicting progression between the 4Kscore and mpMRI, or between using either test alone or both together.

Discussion and Conclusion: Using a 4kscore with a threshold of 7.5% provides good sensitivity for detecting reclassification, but worse specificity compared to mpMRI. These tests help estimate the risk of reclassification and can be useful in recommending the appropriate timing of confirmatory biopsy.