

Discriminative Ability of Decipher to Predict Biopsy Upgrade on Active Surveillance

Benjamin Press, MD; Ghazal Khajir, MD^{*}; Tashzna Jones, MD; Olamide Olawoyin, BS; Michael S. Leapman, MD; Preston C. Sprenkle, MD

Department of Urology, Yale School of Medicine, New Haven, CT, USA

Presenting (contact) author: ghazal.khajir@yale.edu

Introduction

Tissue-based gene expression tests have become increasingly utilized in active surveillance (AS) of favorable-risk PCa. We aimed to assess the prognostic significance of the Decipher assay on biopsy grade progression during AS.

Methods

Between July 2016 and November 2020, 133 men on AS underwent 146 separate MRI-ultrasound fusion targeted biopsies and systematic biopsies with their prostate tissue sent for Decipher testing. Decipher risk categories were labeled as low (<0.45), intermediate (0.45-0.60), or high (>0.60) score. Pathologic upgrade was defined as an increase in Gleason Grade Group (GG) on subsequent biopsy. We assessed the association between Decipher score and upgrade. Cutoff for Decipher score was determined based on receiver operating curve (ROC).

Results

In this cohort, 75.9% and 24.1% of men had GG1 and GG2 PCa, respectively. Median Decipher score was 0.39 (IQR 0.25-0.48) and upgrade occurred in 32.3%. Upgrade rates were similar between Decipher risk groups (31.9% [low] vs 32.4% [intermediate] vs 46.7% [high], $p=0.45$). Upgrade rates were similar when comparing low risk Decipher scores with those ≥ 0.45 . Decipher score was associated with greater odds of upgrade (OR 1.24 per 0.10 unit increase, $p=0.04$). Decipher risk groups were not associated with greater odds of upgrade. When stratifying by Gleason GG, Decipher score was associated with upgrade among patients with diagnostic GG1, (OR 1.29 per 0.10 unit increase, $p=0.04$), but not GG2 disease. The discriminatory ability of Decipher was preserved on multivariate analysis (Table 1). Decipher score remained predictive of upgrade with time to biopsy incorporated in our model (OR 1.36 per 0.10, $p=0.02$). Time to biopsy was not independently associated with upgrade on subsequent biopsy. We identified a Decipher cutoff of 0.475 for prediction of biopsy upgrade while on AS. Difference in upgrade rates were statistically significant between men with Decipher scores <0.475 vs men with Decipher score ≥ 0.475 (26% vs 48.6%, $p=0.01$). Decipher scores ≥ 0.475 were associated with increased odds of biopsy upgrade (OR 2.69, $p=0.01$).

Conclusion

Increasing Decipher scores was associated with greater odds of upgrade among men on AS for PCa. The lower spectrum of Decipher scores among men on AS may suggest that distinct categories may be appropriate for risk grouping in this population.

Variable	p-value	Odds Ratio	95% CI for OR	
			Lower	Upper
Age	0.442	1.019	0.971	1.070
MRI Upgrade	0.402	0.667	0.000	16.373
PSA density	0.344	0.073	0.581	3.873
Decipher	0.033	1.31	1.021	1.689