PROGNOSTIC AND CLINICAL UTILITY CAPABILITIES OF CELL CYCLE PROGRESSION TESTING, PROSTATE IMAGING-REPORTING AND DATA SYSTEM SCORING, AND CLINICOPATHOLOGIC DATA IN MANAGEMENT OF LOCALIZED PROSTATE CANCER

David Morris, MD1; J. Scott Woods, FNP-BC1; Lauren Lenz, MS2; Jennifer Logan, PhD2; Todd Cohen, PhD2; Steven Stone, PhD2

BACKGROUND

- Though guidelines support MRI as a diagnostic tool, evidence that PI-RADS are prognostic remains limited.
- We compared prognostic and clinical utility capabilities among cell cycle progression (CCP) testing, mpMRI with PI-RADS, and clinicopathologic data in select medical management scenarios. We assessed:
  - Distributions of CCP scores, clinical cell-cycle risk (CCR) scores, and clinicopathologic data relative to PI-RADS.
  - Ability to predict tumor grade post-radical prostatectomy.
  - Impact on treatment selection.

METHODS

- Retrospective, observational analysis of data from sequential patients (N=222, two cohorts) from a single Urology community practice (January 2015–June 2018).
  - Cohort 1 (n=156): Newly diagnosed with localized prostate cancer (PrCa).
  - Cohort 2 (n=66): Already on active surveillance (AS).
- Inclusion criteria: Diagnosed with localized PrCa; had a biopsy ultrasound fusion targeted biopsy; and had a biopsy CCP test result.
- CCP test measured the expression of 31 CCP genes and was combined in a validated model with the UCSF Cancer of the Prostate Risk Assessment (CAPRA) score (0.57×CCP + 0.39×CAPRA) (Cuzick et al., Br J Cancer, 2015).

RESULTS

- In combined Cohorts, weak but significant correlations were seen between PI-RADS and CCP, CAPRA, or CCR, suggesting that much prognostic information captured by these measures is independent (Figure 1).
- On multivariate analysis, CCP was a significant predictor of higher-grade tumor (Gleason score ≥4+3) after radical prostatectomy, with the resected tumor ~4 times more likely to harbor a higher-risk Gleason score with every 1-unit increase in CCP (Table 1).
- On multivariate analysis, both CCP and CCR were significant and independent predictors of AS versus curative therapy in Cohort 1. Each 1-unit increase in CCP corresponded to ~2-fold greater likelihood of selecting curative therapy (Table 2).
- CCR score at or below the AS threshold significantly reduced the probability of selecting curative therapy over AS [OR 0.28 (95% CI 0.13, 0.57), p=0.00044].

CONCLUSIONS

- The CCP score was a better predictor of both tumor grade and treatment selection than were PI-RADS scores.
- A broad portfolio of clinical, imaging, and molecular measures remains essential to ensure the most accurate and precise risk assessment to inform treatment selection.