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The first prospective evaluation of the novel urine biomarker Spermine in predicting prostate cancer

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Conflict of Interest Disclosure

I have no potential conflict of interest to report

Objective

ß To evaluate the performance of a novel non-prostate massage urine biomarker Spermine in predicting prostate cancer (PCa)

Methods

ß 556 consecutive men in 2 hospitals were prospectively recruited.

ß The first 30ml of urine without prior prostatic massage was saved immediately before a 10-core systematic prostate biopsy

ß The performance of the urine Spermine in predicting any grade PCa and Gleason 7 or above PCa (HGPCa) was evaluated using Area-under-curve (AUC), multivariate analyses and decision curve analyses(DCA).

Results

- ß   Data on 390 men with PSA 4-20ng/mL was analysed.
- ß   Median age = 68 (IQR 64-72)
- ß   Median PSA = 8.5 (IQR 6.2-11.8) ng/mL
- ß   32.6% PCa and 16.7% HGPCa was diagnosed

- ß   Normalized spermine was inversely associated with prostate cancer
- ß   Mean Spermine level in:
  - ⇑   PCa = 2.27 Vs Non-PCa = 7.8 (t-test, p=0.003)
- ß   A clear distinction of PCa and HGPCa risks is observed when Spermine level was divided into 4 quartile groups (Table 1)
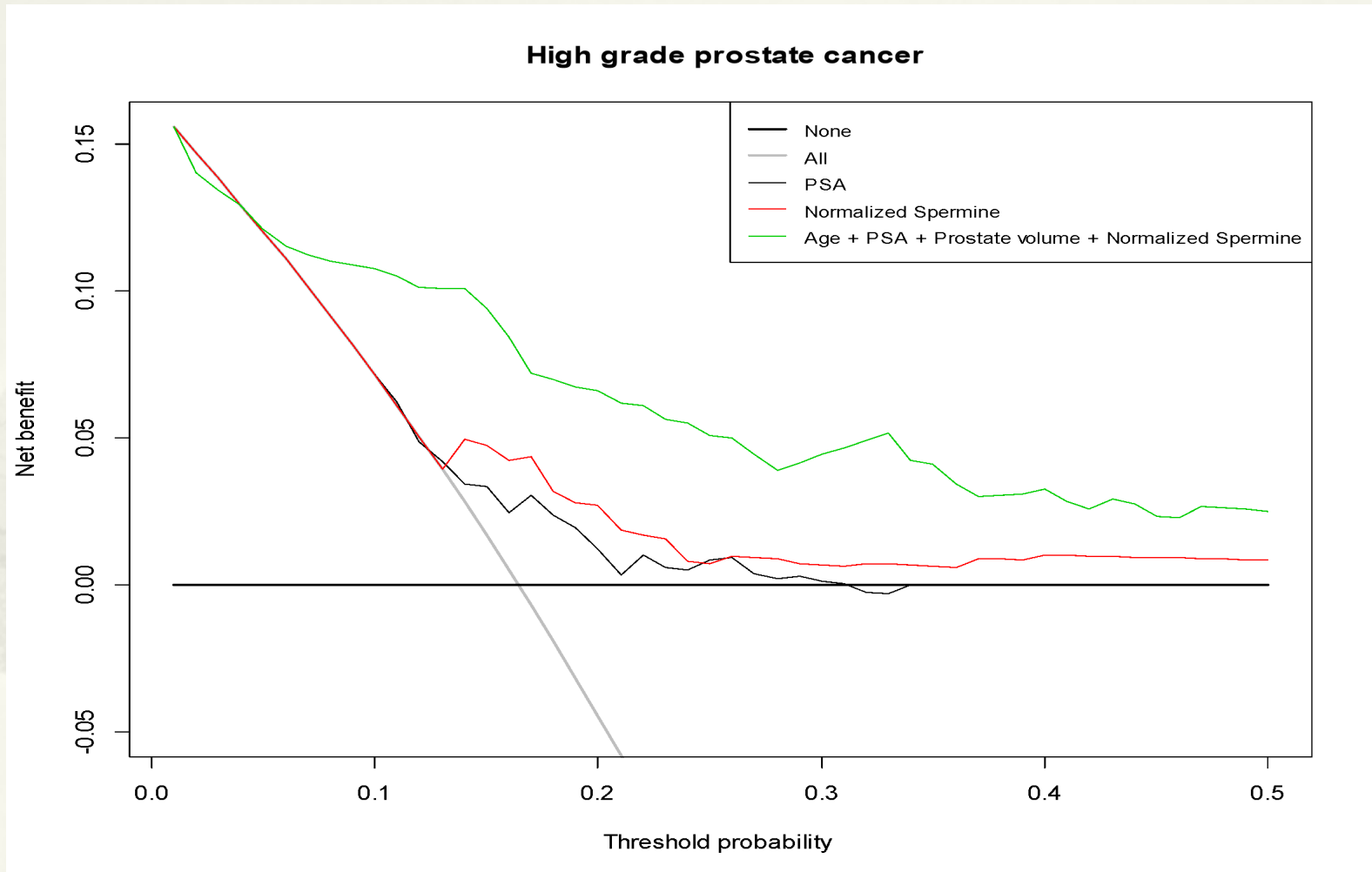
Spermine level and PCa/HGPCa risks

A clear distinction of PCa and HGPCa risks is observed when Spermine level was divided into 4 quartile groups

Spermine level	<0.9275	0.9275-2.355	2.355-5.3625	> 5.3625
PCa	57.7% (56/97)	35.7% (35/98)	25.5% (25/98)	11.3% (11/97)
Gleason ≥7 PCa	34.0% (33/97)	13.3% (13/98)	13.3% (13/98)	6.2% (6/97)

Results

- Age, PSA, Prostate volume and Spermine were all independent predictors of PCa and HGPCa
- Multivariate Spermine score includes: Age, PSA, Prostate volume and Spermine

- AUC for PCa: 0.52 (PSA), 0.71 (Spermine), 0.76 (Spermine density), and 0.80 (Spermine score)
- AUC for HGPCa: 0.60 (PSA), 0.67 (Spermine), 0.72 (Spermine density), and 0.81 (Spermine score)

- At 90% sensitivity (Spermine score) for HGPCa, the negative predictive values was 96.7% (HGPCa), while avoiding 50.7% unnecessary biopsies

Decision curve analysis (HGPCa) showing net clinical benefit of Spermine score

High grade prostate cancer

Conclusions

1. Urine Spermine test predicts PCa and HGPCa well without the need of prior prostate massage

2. A multivariate Spermine risk score further improve predictive performance

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Thank you !