Introduction: We recently completed a prospective observational clinical trial of a first-catch urine exosome gene expression signature ExoIntelliScore Prostate (formerly known as EXO106) to predict high-grade prostate cancer, HGPCA (≥ G57) on initial biopsy. The assay accurately predicted HGPCA with an NPV > 90% for an intended use population: men > / = 50 years with an equivocal PSA of 2-10 ng/mL for their first biopsy. Given the current high prostate biopsy rate and potential impact of race we sought to further understand performance of the assay by constructing subcohorts from the validation study.

Methods: Utilizing the ExoIntelliScore Prostate result and clinical data from the 519 patient intended use clinical validation cohort (IU) we constructed several subgroups including: i. prior negative (A, n = 149), ii. combined prior negative + initial biopsy (B, n = 668) and African Americans (C, n = 87). Area under the curve (AUC), NPV, PPV and specificity with validated cut-point assess performance.

Results: There was demographic comparability between the initial intended use (IU; Figure 1) and various subgroups, i.e. prior negative (A; Figure 2), combined prior negative and initial biopsy (B; Figure 3) and African Americans (C; Figure 4) with some exceptions observed (bold) for AA patients; family history (IU, 23%; A: 27%, B: 24%, C: **30%**; positive biopsy rate (IU,48%; A: 34%, B: 45%, C: **52%**; and > / = G57) (IU, 28%; A: 13%, B: 27%; C: **34%**). The AUC range for ExoIntelliScore Prostate + standard of care (i.e. age, race, PSA and family history) between IU and A, B subgroups was 0.72-0.74; AUC for AA was 0.62, except for prior negative biopsy AA patients, AUC 0.80; supporting importance of prior negative biopsy. Of note, applying the ExoIntelliScore Prostate cut-point, A, B yielded an NPV of 91%; including NPV of 89% for AA (initial biopsy) and NPV of 91% for AA with initial + prior negative biopsy.

Conclusions: The ExoIntelliScore Prostate performed equally well in men with or without a prior negative biopsy with comparable results also seen for African Americans. Additional confirmatory studies with more patients are necessary to confirm initial observations.

Extended analysis of a validated urine-exosome signature to predict high grade prostate cancer on initial biopsy maintains performance across multiple sub-groups.

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Table 1. Comparison of Intended use cohort with various sub-groups

<table>
<thead>
<tr>
<th>Cohorts</th>
<th>N</th>
<th>HGP</th>
<th>TP</th>
<th>TN</th>
<th>FP</th>
<th>FN</th>
<th>NPV</th>
<th>PPV</th>
<th>SENS</th>
<th>SPEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>IU - Initial biopsy, (PSA 2-10)</td>
<td>519</td>
<td>28.5</td>
<td>136</td>
<td>126</td>
<td>245</td>
<td>12</td>
<td><strong>91.3</strong></td>
<td>37.9</td>
<td><strong>91.9</strong></td>
<td>34.0</td>
</tr>
<tr>
<td>A - Repeat Biopsy; (PSA 2-10)</td>
<td>149</td>
<td>12.7</td>
<td>16</td>
<td>33</td>
<td>97</td>
<td><strong>39.1</strong></td>
<td><strong>14.2</strong></td>
<td>84.2</td>
<td><strong>25.4</strong></td>
<td></td>
</tr>
<tr>
<td>B - First and Repeat Biopsy (PSA 2-10)</td>
<td>668</td>
<td>25.0</td>
<td>152</td>
<td>155</td>
<td>346</td>
<td>15</td>
<td><strong>91.2</strong></td>
<td>30.5</td>
<td><strong>91.0</strong></td>
<td>31.0</td>
</tr>
<tr>
<td>C - African-American; Initial Biopsy (PSA 2-10)</td>
<td>87</td>
<td>33.3</td>
<td>27</td>
<td>16</td>
<td>42</td>
<td><strong>288.9</strong></td>
<td><strong>93.1</strong></td>
<td><strong>27.6</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

References:

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