An Irish Prostate Cancer Risk Calculator

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Objectives

Accurate risk stratification of patients pre-biopsy is essential for the diagnosis of prostate cancer (PCa). The objective of this study is to build an Irish PCa risk calculator to facilitate the decision for prostate biopsy within the Irish population.

Methods

The clinical information of 4,808 patients from 8 Irish rapid access prostate centres was analysed. A risk calculator for the diagnosis of PCa and another for the diagnosis of high grade (Gleason ≥7) PCa were created via logistic regression. The models underwent 10 fold cross validation and were internally validated in each cohort. The components of the risk calculators are age, digital rectal examination, family history of PCa, prior negative biopsy and PSA level.

Table 1: The Performance of the Irish PCa Risk Calculator

<table>
<thead>
<tr>
<th>Prostate Cancer</th>
<th>High Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA</td>
<td>Irish PSA</td>
</tr>
<tr>
<td>Beaumont</td>
<td>400</td>
</tr>
<tr>
<td>Cork</td>
<td>318</td>
</tr>
<tr>
<td>Mater</td>
<td>982</td>
</tr>
<tr>
<td>St James</td>
<td>267</td>
</tr>
<tr>
<td>St Vincents</td>
<td>679</td>
</tr>
<tr>
<td>Galway</td>
<td>1,164</td>
</tr>
<tr>
<td>Limerick</td>
<td>772</td>
</tr>
<tr>
<td>Waterford</td>
<td>193</td>
</tr>
</tbody>
</table>

Results

The Irish Prostate Cancer Risk Calculator (IPRC) demonstrated a significantly improved predictive ability over PSA alone and the PCPT risk calculator, in terms of both PCa and high grade PCa (p<0.001).

The novel model also demonstrated a net benefit on decision curve analysis and good calibration (Figure 2).

Figure 1

The 8 Irish Rapid Access Prostate Cancer Clinics

Figure 2

The IPRC demonstrates good calibration for a PCa diagnosis (A) and high grade PCa (B). Itt also displays an increase in net benefit over the PCPT across its range of predictions (C & D)

Conclusion

An Irish prostate cancer risk calculator created from a national collection of patients can allow for individualised risk stratification and can be used to improve clinical decision making in Irish men under investigation for PCa.