Results of a Dutch cost-effectiveness model of radium-223 in comparison to cabazitaxel, abiraterone, and enzalutamide in patients with metastatic castration-resistant prostate cancer treated with docetaxel

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Introduction

Background

• The treatment landscape of metastatic castration resistant prostate cancer (mCRPC) has evolved to include cabazitaxel (CA), abiraterone acetate (AA), enzalutamide (EN) and radium-223 (Ra-223).

• Ra-223 is approved for use in patients with mCRPC who are progressing despite docetaxel (CA), abiraterone acetate (AA), enzalutamide (EN) and novel non-visceral metastasis in both docetaxel-naïve and post-docetaxel settings.

• Little is known about the cost-effectiveness of these novel agents. This study investigates the cost-effectiveness of Ra-223 in the Netherlands.

Objectives

To investigate the cost-effectiveness of Ra-223 compared to CA, AA and EN, in combination with best standard of care (BSc), in Dutch mCRPC patients previously treated with docetaxel.

Methods

ALSYMPCA

• The efficacy and safety of Ra-223 have been evaluated in a double-blind, randomized, multinational, phase III study of Ra-223 (ALSYMPCA) in the treatment of patients with mCRPC.

• Patients recruited in the trial either received docetaxel or were unwilling or unfit to receive docetaxel before the randomization to Ra-223 or BSc or placebo.

• In ALSYMPCA, Ra-223 vs placebo

• Improved median overall survival (OS) by 3.6 months (HR = 0.695; p < 0.001).

• Improved median time to first symptomatic skeletal-related event (SSE) by 5.8 months (HR = 0.658; p < 0.001).

Cost-effectiveness model

• Cost-effectiveness was evaluated using a Markov model with five health states (Figure 1).

Table 1. Results for costs and health benefits per comparison.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Cost (€)</th>
<th>Benefit (LY)</th>
<th>Cost-utility analysis (CUA)</th>
<th>Clinical analysis (CA)</th>
<th>Cost-effectiveness analysis (CEA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ra-223</td>
<td>€76,014</td>
<td>1.28</td>
<td>€76,014</td>
<td>1.28</td>
<td>€76,014</td>
</tr>
<tr>
<td>CA</td>
<td>€90,347</td>
<td>1.34</td>
<td>€90,347</td>
<td>1.34</td>
<td>€90,347</td>
</tr>
<tr>
<td>EN</td>
<td>€81,926</td>
<td>1.36</td>
<td>€81,926</td>
<td>1.36</td>
<td>€81,926</td>
</tr>
<tr>
<td>Difference</td>
<td>€14,333</td>
<td>-0.06</td>
<td>€14,333</td>
<td>-0.06</td>
<td>€14,333</td>
</tr>
</tbody>
</table>

Results

• Disease progression was defined by:

  - an increase ≥ 25% in prostate specific antigen level from baseline level at ≥ 12 weeks in patients with no decrease from baseline, or
  - an increase ≥ 50% in prostate specific antigen level above the nadir, confirmed ≥ 3 weeks later in patients with initial decrease from baseline level.

• Efficacy, safety and quality adjusted life year (QALY) data were obtained from Phase III ICT (ALSYMPCA), CA (TROPIC trial), AA (COU-AA-301 trial) and EN (AFFIRM trial) was obtained by indireクトtly linking trial data to Ra-223 data that cabazitaxel were not available, we conservatively assumed these to be identical to Ra-223 (Table 2). Costs of SSE were taken from Dutch sources.

• Outcomes include: total and incremental costs, total and incremental quality adjusted life years (QALYs), total and incremental lifetime gained (LYs), and incremental cost-effectiveness ratios (ICERs).

• The model was validated by specialists in the mCRPC treatment field.

Cost and statistical analyses

• Unit costs were retrieved from published sources and conform to the Dutch guideline on cost-research.

• Costs were calculated over a lifetime horizon (defined as 5-years).

• Cost-effectiveness analysis (CEA) was used to analyse the cost-effectiveness of Ra-223 against selected comparators.

• Analyses were performed from a societal perspective, including costs outside the health care budget, and discounted at 4% for costs and 1.5% for health effects.

• Probabilistic sensitivity analysis was used to assess the uncertainty of the results for cost-effectiveness.

Table 2. Frequency and treatment costs of SSEs associated with Ra-223, CA and EN.

<table>
<thead>
<tr>
<th>SSE</th>
<th>Ra-223</th>
<th>CA</th>
<th>EN</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSE costs</td>
<td>€5,058</td>
<td>€5,058</td>
<td>€5,058</td>
</tr>
<tr>
<td>Drug costs</td>
<td>€2,126</td>
<td>€2,126</td>
<td>€2,126</td>
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<tr>
<td>Total costs</td>
<td>€7,184</td>
<td>€7,184</td>
<td>€7,184</td>
</tr>
</tbody>
</table>

Conclusions

• Our model shows that the effectiveness expressed in QALYs and LYG are comparable for Ra-223 as compared to CA, AA, and EN in the post-chemotherapy setting.

• However, the lifetime costs of mCRPC patients in the Netherlands are lower for Ra-223 treated patients, which are mainly driven by lower drug costs.

• Therefore, Ra-223 is a cost-saving treatment compared to CA, AA, and EN in Dutch mCRPC patients previously treated with docetaxel.

References

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Disclosures

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