A cost–effectiveness test compared to standard care in breast cancer patients in France

Dorey J1, Disset A2, Neine Me1, Plun-favreau J3, Toumi M3
1 Creativ-Cehtical, Paris, France; 2 Genomic Health, Geneva, Switzerland; 3 Aix-Marseille University, Marseille, France

BACKGROUND

• Breast cancer is the commonest cancer among women in France. About 53,000 new cases were diagnosed in 2011, representing 33% of all newly diagnosed women with cancer.1
• Chemotherapy is often associated with many side effects over short and long-term with important medical costs and can have a serious psychological impact among patients, such as anxiety and emotional distress.2
• The 21-gene Breast Cancer Test (Oncotype DX®) is a validated diagnostic test that predicts the likelihood of chemotherapy benefit and breast cancer recurrence in selected patients with early-stage breast cancer.

OBJECTIVES

• A previous cost-effectiveness analysis of Oncotype DX® test versus standard French clinical practice was published in 2012.2 Since then, docetaxel is no longer reimbursed on top of the diagnosis related groups (DRGs) in France.
• The objective of this study was to update the cost-effectiveness analysis considering this change.

METHODS

Patient population
Women diagnosed with early breast cancer in public or private hospitals in France
Comparative interventions
• Usual care was compared with the use of The 21-gene Breast Cancer Test (Oncotype DX®)
Collection of cost data
• Unit costs applicable for April 2015 were collected using standard sources for each resource use item from societal and payer perspectives, taking into account all indemnities from the national health insurance.
• Two previous cost analyses were updated to assess the overall costs of chemotherapy in women with breast cancer in public and private hospitals.

• The first study evaluated the cost of chemotherapy in public hospitals. It was a retrospective study that extracted patient records from the Hospital Tenon (Paris). Analyses were updated to include the new cost structure considering docetaxel cost in the T2A (i.e. DRG in France) and not anymore on top of the T2A,4,5
• The second study evaluated the cost of chemotherapy in private hospital. It was a multicentre retrospective study conducted in seven French private hospitals, all part of the Généralité de Santé group.6
• In order to estimate the cost of chemotherapy, patients were followed from the start (including the pre-chemotherapy period) to the end of adjuvant chemotherapy.
• Patients characteristics and pre-chemotherapy tests and biochemical procedures information were collected.
• Data on chemotherapy regimen, prophylactic agents, side effects visits, hospitalizations, laboratory tests, home care, transport and sick leave were collected at each chemotherapy cycle.

Cost-effectiveness analysis
• The cost-effectiveness analysis was conducted using a Markov model including three health states (survival without recurrence, metastatic recurrence at ten years of death) (Figure 1).
• All patients started simulation in the state “without recurrence”. The model cycle length was one year with a horizon of 30 years.
• The estimation of the cost of chemotherapy resulting from the cost study was used as an input. Other model inputs were the same as in a previous cost-effectiveness model of the 21-gene assay in France.7,8
• The considered health outcomes were life-years and quality-adjusted life-years (QALYs).

Perspective
• The cost-effectiveness analysis was performed from the societal perspective as defined by the Haute Autorité de Santé (HAS), which includes all direct costs for national insurance, private insurance and patients. The total costs included the cost of administration of chemotherapy, drugs, pre-chemotherapy, monitoring, adverse event (AE) management, and transport.

RESULTS

Cost study results
Public hospital
• The 2015 drug prices were associated with an important decrease compared to the 2013 prices. The average decrease in drug prices was 18% (with a range from 0% to 80%).
• The tariffs of nursing, specialist, and diagnostic test have not changed between 2013 and 2015.
• From payer and societal perspective, the cost of chemotherapy drugs decreased from €4,865 to €1,411 (corresponding to a decrease of 97%) due to the inclusion of docetaxel in T2A.
• From societal perspective, average total cost of chemotherapy (SD) was €1,641 (7,203) and ranged from €2,826 to €2,422 (table 1).

Private hospital
• From societal perspective, average total cost was €9,648 (SD = 5,782) and ranged from €1,605 to €34,251. Hospital-specific variances were quiet similar between all private hospitals while many disparities exist in average total cost between hospitals.
• Minimum total cost was €8,082 (SD = 3,459) whereas the maximum cost was €12,250 (SD = 7,987).

Table 1. Cost (€) of different chemotherapy by components for societal and payer perspective.

<table>
<thead>
<tr>
<th>Public hospital</th>
<th>Private hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Societal perspective</td>
<td>Payer perspective</td>
</tr>
<tr>
<td>Administration chemotherapy</td>
<td>3,181 (1384)</td>
</tr>
<tr>
<td>Chemotherapy drugs</td>
<td>141 (30)</td>
</tr>
<tr>
<td>Pre-chemotherapy</td>
<td>476 (39)</td>
</tr>
<tr>
<td>Monitoring</td>
<td>214 (179)</td>
</tr>
<tr>
<td>AE management + prevention</td>
<td>2,438 (2628)</td>
</tr>
<tr>
<td>Transport</td>
<td>159 (258)</td>
</tr>
<tr>
<td>Abx/Abx test</td>
<td>4,308 (6,422)</td>
</tr>
<tr>
<td>Total</td>
<td>6,471 (3,350)</td>
</tr>
</tbody>
</table>

Table 2. Base case results.

<table>
<thead>
<tr>
<th>Public hospital</th>
<th>Private hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference in public hospital</td>
<td>Difference in private hospital</td>
</tr>
<tr>
<td>Total cost</td>
<td>€3,758</td>
</tr>
<tr>
<td>Total cost with absenteism</td>
<td>€4,658</td>
</tr>
<tr>
<td>QALYs</td>
<td>0.14</td>
</tr>
<tr>
<td>Life year</td>
<td>0.15</td>
</tr>
<tr>
<td>Incremental cost per QALY</td>
<td>€4,166</td>
</tr>
<tr>
<td>Incremental cost per life year gained</td>
<td>€3,940</td>
</tr>
</tbody>
</table>

LIMITATION

• While the unit costs as well as the cost structure were updated in the cost studies, the analyses were still based on patient recorded extracted previously (in 2011 for public hospital and 2013 for private hospitals).
• Limitations from the previous analyses described in the publications9,10 still applied to these analyses.

CONCLUSIONS

• While the cost of chemotherapy decreased considerably after the inclusion of docetaxel in the DRGs, the use of the 21-gene test is still cost-effective compared to usual care in French public and private hospitals from a societal perspective.