Assessing and modeling organizational impact of tilmanocept in sentinel lymph node biopsy in breast cancer and melanoma

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Background
Sentinel lymph node biopsy (SLNB) has already become a standard of care for breast cancer patients 1 and selected patients with melanoma 2. However, this technique requires a specific organization including a strong collaboration among different departments within a hospital. Thanks to its molecular characteristics, including its rapid onset of action, its long duration of action and its rapid clearance, tilmanocept, a novel radiotracer indicated in SLNB, could allow hospitals to save time and therefore improve patients’ workflow especially for ambulatory activities.

Objective
The aim of this study was to build a model to assess the organizational impact of tilmanocept in the SLNB for breast cancer and melanoma in ambulatory setting.

Method
In order to know the care pathway related to the SLNB technique and to evaluate the impact of tilmanocept in current practice, 11 practitioners from each specialty concerned with sentinel node biopsy were interviewed:

• 4 nuclear physicians
• 2 radio-pharmacists
• 5 surgeons

Each interview was based on a specific validated guide regarding each specialization and divided into two parts:

The first part of which was designed to learn about their current practices (pathway, time) in the sentinel lymph node technique

The second part of the interview was then devoted to the potential impact that, according to them, tilmanocept could have on the organization in departments involved in the SLNB procedure such as radiopharmacy service, nuclear medicine service and operating room.

Prior to this one-hour interview, the characteristics of tilmanocept, as described within the Summary of Product Characteristics (SmPC), including its rapid onset of action, its prolonged localisation time within sentinel node, its rapid clearance and its efficacy from phase III clinical results were sent out for information.

Information collected during the interviews was supplemented by a literature review and PMS® data. Then an organizational model based on information collected was built.

Model and Inputs
The model considers the time spent to set up a SLNB service with different radiotracers in a cohort of patients undergoing SLNB procedure and calculates time-saving by tilmanocept compared to radiotracers currently used in hospital. The saved time by the comparator, tilmanocept could save between 37 and 45 hours per week in all indications for the entire cohort with Tilmanocept Vs

Results
A hypothetical cohort of 30 patients with breast cancer and 20 patients with melanoma undergoing SLNB per week was entered in the model.

In breast cancer:

<table>
<thead>
<tr>
<th>Time saving and additional patients per week in Breast Cancer in ambulatory setting with Tilmanocept Vs</th>
<th>Collid</th>
<th>Time saving (min)</th>
<th>Potential additional patients</th>
<th>Ambulatory increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colloid</td>
<td>Time saving (min)</td>
<td>Potential additional patients</td>
<td>Ambulatory increase</td>
<td></td>
</tr>
<tr>
<td>Rhenium sulphide</td>
<td>2190</td>
<td>37</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Human serum albumin</td>
<td>37</td>
<td>45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In melanoma:

<table>
<thead>
<tr>
<th>Time saving and additional patients per week in Melanoma in ambulatory setting with Tilmanocept Vs</th>
<th>Collid</th>
<th>Time saving (hours)</th>
<th>Potential additional patients</th>
<th>Ambulatory increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collid</td>
<td>Time saving (hours)</td>
<td>Potential additional patients</td>
<td>Ambulatory increase</td>
<td></td>
</tr>
<tr>
<td>Rhenium sulphide</td>
<td>3</td>
<td>1</td>
<td>38%</td>
<td></td>
</tr>
<tr>
<td>Human serum albumin</td>
<td>3</td>
<td>1</td>
<td>38%</td>
<td></td>
</tr>
</tbody>
</table>

According to the comparators, tilmanocept could save between 37 and 45 hours per week for the entire cohort of patients undergoing SLNB.

In ambulatory setting, tilmanocept could save between 5 and 6 hours per week in breast cancer. The time saved can be converted into 1 additional patient per week eligible for SLNB for breast cancer which could represent an ambulatory growth of 22%.

For melanoma, tilmanocept could save 3 hours per week. The time saved can be converted into 1 additional patient per week eligible for SLNB for melanoma which could represent an ambulatory growth of 38%.

Conclusion
Tilmanocept could reduce the procedure times (preparation, administration, imaging) and therefore decrease time of procedure for all patients and increase ambulatory activity of the SLNB in breast cancer and melanoma.

Discussion
The model allows to simulate a cohort of patients undergoing SLNB and to see the impact of the introduction of tilmanocept. The model is extremely flexible to adapt to all hospitals but requires a lot of information that may be time consuming to input.

Further, the model does not simulate the path of patients undergoing detection and surgery in two different hospitals. Finally, the impact of tilmanocept’s prolonged localisation time within sentinel node (up to 30 hours), which could have an impact on the pathway flexibility, is not modeled.

References
4. International Society for Pharmacoeconomics and Outcomes Research (ISPOR). Assessment and modeling of organizational impact of tilmanocept. ISPOR 21st Annual European Congress - 10-14 November 2018 / Barcelona