Cost-effectiveness of cetuximab and panitumumab for first-line RAS WT metastatic colorectal cancer

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Introduction

Metastatic colorectal cancer (mCRC) is a disease that has spread beyond the large intestine and nearby lymph nodes.

Liver resection can offer long-term survival in patients with mCRC. However, the majority of such patients are not eligible for liver resection due to widespread nature of their disease.

Chemotherapy can significantly downsize primarily unresectable metastases and offer the possibility of resection in mCRC patients.

Chemotherapy with cetuximab (CET) (Erbitux®, Merck Serono) and panitumumab (PAN) (Vectibix®, Amgen) appears to be more effective for patients with RAS (rat sarcoma) WT (wild type) tumors (i.e., tumors without mutations in KRAS/NRAS exons 2/3/4).

The National Institute for Health and Care Excellence (NICE) is conducting a multiple technology appraisal (MTA) to review the clinical and cost-effectiveness of combination chemotherapies with CET and PAN for people with previously untreated RAS WT mCRC, not eligible for liver surgery.

Preliminary cost-effectiveness results of this study are presented here.

Key: BSC = best supportive care; CET = cetuximab; FOLFIRI = folinic acid + fluorouracil + oxaliplatin; FOX = folinic acid + fluorouracil + oxaliplatin; ICER = incremental cost-effectiveness ratio; MTA = multiple technology appraisal; PAN = panitumumab; QALY = quality adjusted life year.

Methods

Model overview

We proposed an economic model estimating medical costs and health benefits of CET and PAN compared to treatments currently available in the NHS (Fig. 1).

Figure 1: Model structure

- Time horizon: 30 years
- Perspective: NHS and personal social service
- Discount rate: 3.5% per annum
- Unit costs: inflated to 2015/16 prices

Network meta-analysis

- The analysis was based on five RCTs identified for RAS WT mCRC patients, they are likely to be more effective for patients with RAS (rat sarcoma) WT (wild type) tumors (i.e., tumors without mutations in KRAS/NRAS exons 2/3/4).

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References


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Results

Base case

CET and PAN do not appear cost-effective at the willingness-to-pay (WTP) threshold of £20,000 per QALY gained, compared to chemotherapy alone (FOLFOX or FOLFIRI) (Table 1).

Potentially not cost-effective at zero price

ICERs remain above £20,000 even under zero prices for CET and PAN (Table 1).

Table 1: Cost-effectiveness of CET and PAN

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Comparator</th>
<th>Total costs</th>
<th>Total QALYs gained</th>
<th>Incremental cost (base case)</th>
<th>Incremental QALYs (base case)</th>
<th>ICER (£/QALY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CET+FOLFIRI</td>
<td>FOLFIRI</td>
<td>£109,001</td>
<td>2.00</td>
<td>£19,000</td>
<td>0.20</td>
<td>£27,000</td>
</tr>
<tr>
<td>PAN+FOLFIRI</td>
<td>FOLFIRI</td>
<td>£139,007</td>
<td>2.00</td>
<td>£27,000</td>
<td>0.20</td>
<td>£27,000</td>
</tr>
</tbody>
</table>

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Sensitivity analyses

The likelihood of being the most cost-effective treatment at the WTP of £20,000 per QALY gained (Fig. 3):

- CET+FOLFIRI: 22% (base case)
- PAN+FOLFIRI: 0% (base case)
- CET+FOLFIRI: 0% (base case)

Figure 3: Cost-effectiveness acceptability curves

The major sources of prediction uncertainties:

- Proportion of patients undergoing liver resection
- PFS for unresected patients, and PFS and OS post-resection
- Treatment duration

Conclusions

Although CET and PAN appear to be clinically beneficial for RAS WT mCRC patients, they are likely to represent poor value for money when judged by cost-effectiveness criteria used in England and Wales.