

Cost Analysis Of Metastatic Colorectal Cancer Treatment With Bevacizumab And Cetuximab

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Background

- Colorectal cancer is one of the tumours with greater mortality rates in Spain. ⁽¹⁾
- The development of monoclonal antibodies is associated to significant progress in metastatic colorectal cancer (mCRC). ⁽²⁾

Objective

To estimate the cost of first-line treatment of mCRC with two different monoclonal antibodies: bevacizumab and cetuximab

Methods

- A cost analysis model was developed to assess the cost of 6 months of treatment with bevacizumab or cetuximab ^(3, 4) under the hospital perspective in Spain.
- The following direct medical costs were included: drug cost and administration cost.
- Drugs costs were calculated from the doses recommended in the summaries of product characteristics.
- Premedication cost of patients treated with cetuximab (dexchlorpheniramine iv, 5mg) was also included.
- Costs were obtained from the Spanish Catalogue of Medicines ⁽⁵⁾ and a Spanish healthcare cost database. ⁽⁶⁾ (Table 1)
- All costs were expressed in euros (€ , 2010).

Base Case

- Anthropometric characteristics were based on a review of 86 medical registries of mCRC patients, considering an average weight and body surface area of 70.4 kg and 1.80 m² respectively.
- No drug wastage was considered.
- Bevacizumab cost/mg was the mean of 4mL and 16mL vials.
- Administration cost was based on the cost of a hospital oncology session and frequency of administrations required for each assessed alternatives.
- One-way sensitivity analyses were developed modifying the parameters with greater uncertainty.
- Multiway sensitivity analyses were also conducted to define the most and the least costly scenario for each therapy.

Table 1. Unitary cost (€ , 2010)

Resource	Unitary Cost (€)
Oncology session	166.07
Cost /hour of nurse staff	18.53
Drug- (ex-factory price)	
Bevacizumab- Avastin®, 4mL vial (100mg)	341.71
Bevacizumab- Avastin®, 16mL vial (400mg)	1,272.89
Cetuximab- Erbitux®, 20 mL vial (100mg)	192.30
Dexclorfeniramina- Polaramine®, 5mg, 5 ampoules, 1mL	5.10

Results

- Drug costs and administration costs were lower with bevacizumab than with cetuximab.
- In the base case, total estimated cost per patient was €17,258 when bevacizumab was administered every two weeks, €16,539 when bevacizumab was administered every 3 weeks and €27,363 with cetuximab, showing savings of bevacizumab versus cetuximab of 37% - 40%. (Table 2).
- All sensitivity analyses confirmed that the treatment with bevacizumab is associated with lower costs than the treatment with cetuximab. (Table 3 and Figure 1).
- Multiway sensitivity analyses showed that the total cost in the most costly scenario for bevacizumab is lower than the total cost in the least costly scenario for cetuximab. (Figure 1)

Table 2. Cost per patient. Base Case (€ , 2010)

	Bevacizumab (5mg/Kg every 2 weeks)	Bevacizumab (7.5mg/Kg every 3 weeks)	Cetuximab	Cost difference (%). Cetuximab versus Bevacizumab	
				Bevacizumab (5mg/Kg every 2 weeks)	Bevacizumab (7.5mg/Kg every 3 weeks)
Drug Cost (€)	15,099	15,099	23,018	-7,919 (-34%)	-7,919 (-34%)
Premedication cost (€)	0	0	27	-27 (-100%)	-27 (-100%)
Administration cost (€)	2,159	1,439	4,318	-2,159 (-50%)	-2,879 (-67%)
TOTAL COST (€)	17,258	16,538	27,363	-10,104 (-37%)	-10,824 (-40%)

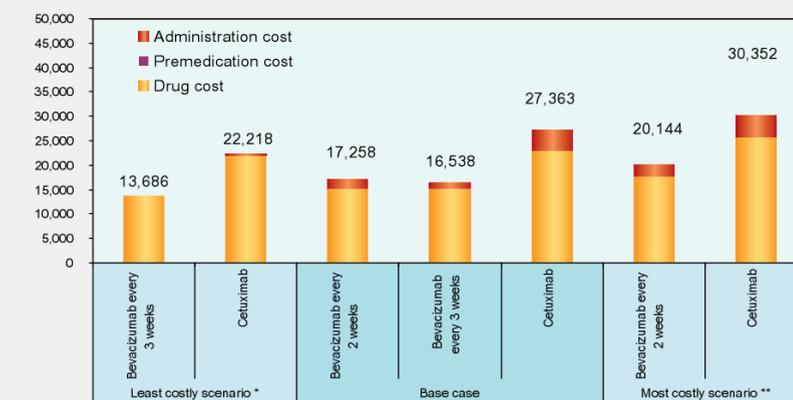
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Table 3. Cost per patient. One-way sensitivity analyses (€ , 2010)

Parameter	Bevacizumab (5mg/Kg every 2 weeks)	Bevacizumab (7.5mg/Kg every 3 weeks)	Cetuximab	Cost difference (%). Cetuximab versus Bevacizumab	
				Bevacizumab (5mg/Kg every 2 weeks)	Bevacizumab (7.5mg/Kg every 3 weeks)
With drug wastage	18,706	18,394	29,920	-11,214 (-37%)	-11,526 (-39%)
Weight and body surface area: 66 Kg and 1,72m ²	16,314	15,595	26,340	-10,025 (-38%)	-10,745 (-41%)
Weight and body surface area: 75 Kg and 1,75m ²	18,245	17,525	26,723	-8,478 (-32%)	-9,198 (-34%)
Treatment duration: 4 months	11,505	11,026	18,415	-6,909 (-38%)	-7,389 (-40%)
Treatment duration: 8 months	23,011	22,051	36,310	-13,300 (-37%)	-14,259 (-39%)
Bevacizumab cost based on 16mL vial price	16,721	16,001	27,363	-10,642 (-39%)	-11,362 (-42%)
Bevacizumab cost based on 4 mL vial price	17,796	17,076	27,363	-9,567 (-35%)	-10,287(-38%)
Administration cost based on oncology session cost -10%	17,042	16,395	26,931	-9,889 (-37%)	-10,536 (-39%)
Administration cost based on oncology session cost +10%	17,474	16,682	27,795	-10,320 (-37%)	-11,112 (-40%)
Administration cost based on nurse time only	15,149	15,133	23,241	-8,092 (-35%)	-8,108 (-35%)

Figure 1. Cost per patient- 6 months. Multiway sensitivity analyses results



- * Least costly scenario: no drug wastage, 66 kg and 1.72m² per patient, bevacizumab administered every 3 weeks and based on 16ml vial cost, administration cost based on nurse time cost.
- ** Most costly scenario: with drug wastage, 75 kg and 1.80 m² per patient, bevacizumab administered every 2 weeks and based on 4mL vial cost, administration cost based on oncology session cost + 10%.

Conclusion

In Spain, 6 months of treatment of mCRC patients with bevacizumab could result in savings ranging between €10,104 and €10,824 per patient versus the treatment with cetuximab.