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Survey and analysis of the costs of metastatic colorectal cancer treatment in Slovakia

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INTRODUCTION

- Colorectal cancer (CRC) is fourth most common malignant tumour in the world. Worldwide, one million new cases are reported every year, and in 2007 CRC was the cause of death of 319,000 men and 284,000 women globally [1]. According to the World Health Organization (WHO), the standardised mortality ratio in Slovakia is currently 25.4 per 100,000 people [2].
- This study was designed to assess the cost of first-, second and third-line treatment in patients with metastatic CRC (mCRC) in Slovakia (as part of a multinational study in Central Europe) and to examine current practice in Slovakia, especially the utilization of monoclonal antibodies, and to investigate possibility of introducing new biological therapies in current practice.

OBJECTIVES

Primary objectives:

- describe chemotherapy regimens used
- estimate costs of chemotherapy regimens, supportive care and medical procedures.

Secondary objectives:

- estimate additional costs related to chemotherapy (additional medications and services),
- estimate the proportion of patients treated with particular chemotherapy regimens,
- estimate the proportion of patients who refused chemotherapy,
- describe the factors affecting treatment choice made by oncologists.

METHODS

- This was an expert opinion based study (based on the review of medical data). The data were collected by oncologists from 3 oncology centres in Slovakia, providing access to medical records of approximately 1,600 patients treated in 2008.
- Access to CEDAR was granted to the investigators. All connections were encrypted. Data on chemotherapy regimens used in clinical practice in the treatment of mCRC were collected and automatically validated by the application. Data on chemotherapy regimens used in clinical trials were excluded from the study.
- Direct medical costs from a public payer perspective were calculated from information provided by an oncologist on unit costs of medicines and services. Costs of chemotherapeutic drugs, administration of chemotherapy and hospitalisation, additional medicines and services (related to application of chemotherapy and monitoring) were included in calculating the total cost of each regimen. Costs of treatment of adverse events were not estimated in this study.

CONCLUSION

- Most commonly used regimens were cetuximab + irinotecan and capecitabine. The majority of patients received at least one regimen with monoclonal antibody during treatment of metastatic colorectal cancer. Less than 50% of patients were treated with a third line of chemotherapy.
- The average regimen cost was the highest in first-line therapy and decreased in the following lines. Costs of additional medications and services appeared to have minimal impact on the overall cost of therapy, irrespective of the treatment line.
- Regimens based on monoclonal antibodies incurred the highest costs. The average cost of these regimens was almost twice as expensive as the average cost of regimens without monoclonal antibodies.
- Ultimately, our study has shown that the use of targeted anti-cancer agents is associated with substantially high costs, however many studies have shown that they are also associated with survival gains, safety and reduction in adverse events.

REFERENCES

1. American Cancer Society. Global Cancer Facts and Figures 2007. http://www.cancer.org/acs/groups/content/@nho/documents/document/globalfactsandfigures-2007rev2p.pdf (6.9.2010).
2. http://www.who.int/entity/healthinfo/statistics/bodgbddeathdalyestimates.xls (6.9.2010).

RESULTS

Most commonly used regimens

- In first-line therapy, the highest percentage of patients (almost 39%) was treated with regimens based on irinotecan, 5-FU, folinic acid and bevacizumab (IFL + bevacizumab BB and FOLFIRI + bevacizumab). 16% of patients received capecitabine in this line.
- In second line, the most commonly used regimen was cetuximab + irinotecan (36% of patients).
- Capecitabine was the most popular regimen in the third line (28% of patients), however also cetuximab + irinotecan (23%) and panitumumab (nearly 19%) were frequently used.
- The most popular regimens administrated in the first, second or third line of treatment was cetuximab + irinotecan (36% of patients) and capecitabine (30%).
- Monoclonal antibodies were used in case of 39%, 36% and 42% of patients in the first, second and third line respectively. About 56% of patients received regimens with monoclonal antibody in at least one line of treatment.
- Less than 3% of patients refused chemotherapy.

Figure 1. Most commonly used regimens in each line

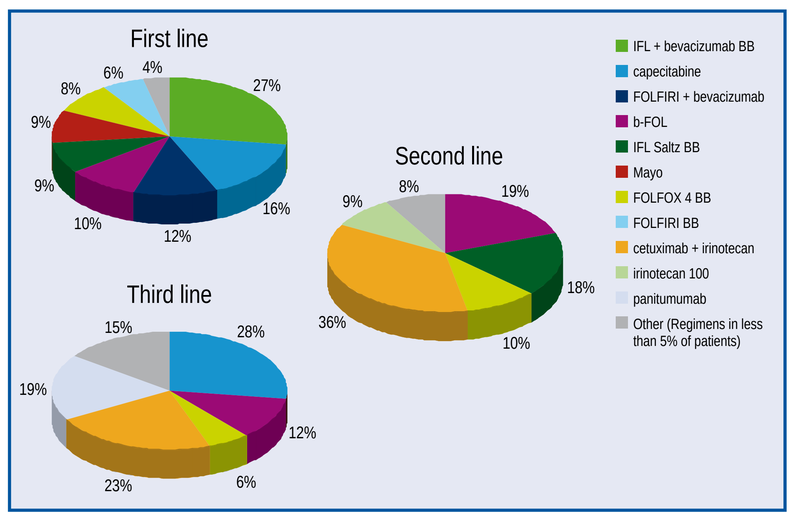


Table 1. Chemotherapy regimens used in the treatment of mCRC in Slovakia

Regimen	Medications
IFL + bevacizumab BB	irinotecan (1 dose x125 mg/m2 per cycle), 5-FU (1x500 mg/m2), folinic acid (1x20 mg/m2), bevacizumab (3x5 mg/m2)
Mayo	5-FU (5x425 mg/m2), folinic acid (5x20 mg/m2)
capecitabine	capecitabine (14x2500 mg/m2)
b-FOL	oxaliplatin (2x85 mg/m2), 5-FU (3x500 mg/m2), folinic acid (3x20 mg/m2)
panitumumab	panitumumab (1x6 mg/kg)
cetuximab + irinotecan	irinotecan (4x125 mg/m2), cetuximab (6x250 mg/m2)
FOLFIRI + bevacizumab	irinotecan (1x180 mg/m2), 5-FU (2x400 mg/m2), 5-FU (2x600 mg/m2), folinic acid (2x200 mg/m2), Bevacizumab (1x5 mg/m2)
FOLFIRI BB	irinotecan (1x180 mg/m2), 5-FU (2x400 mg/m2), 5-FU (2x600 mg/m2), folinic acid (2x200 mg/m2)
FOLFOX 4 BB	oxaliplatin (1x85 mg/m2), 5-FU (2x600 mg/m2), 5-FU (2x600 mg/m2), folinic acid (2x200 mg/m2)
IFL Saltz BB	irinotecan (4x125 mg/m2), 5-FU (4x500 mg/m2), folinic acid (4x20 mg/m2)
irinotecan 100	irinotecan (4x100 mg/m2)

Paths of treatment

- Most commonly used paths of chemotherapy are presented in Table 2.
- The percentages of patients receiving chemotherapy after the first line are presented in Figure 2. The remaining patients received best supportive care

Costs of treatment

- The mean cost of each regimen in each line of therapy is summarised in Figures 3–5.
- Overall, first-line therapy was the most expensive, followed by second and third line. Biologic drug-containing regimens were always the most expensive in each line.
- Factors influencing the selection of chemotherapy by oncologists included: previous therapies, course of the disease, the patient's performance status, adverse events after previous chemotherapies, age of patient and concomitant diseases.

Table 2. Most common paths of chemotherapy

First line	Second line	Third line	% of patients
capecitabine	-	-	8%
IFL + bevacizumab BB	cetuximab + irinotecan	-	6%
IFL + bevacizumab BB	-	-	5%
Mayo	-	-	4%
IFL + bevacizumab BB	cetuximab + irinotecan	capecitabine	4%

Figure 2. Patients receiving chemotherapy after the first line

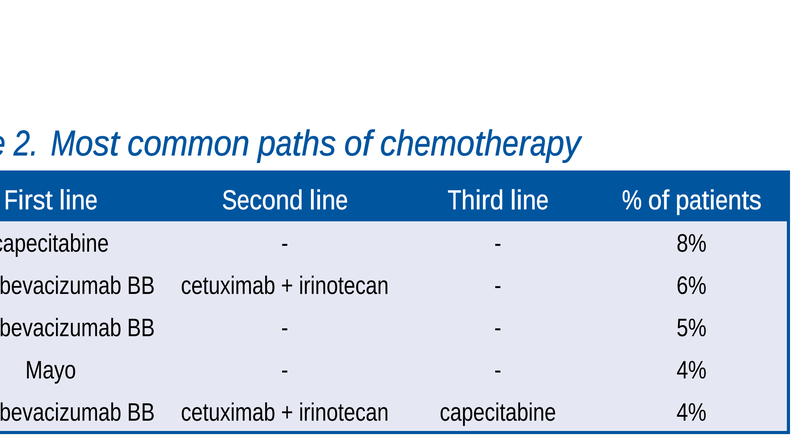


Figure 3. Total cost of regimens per patient in first-line therapy

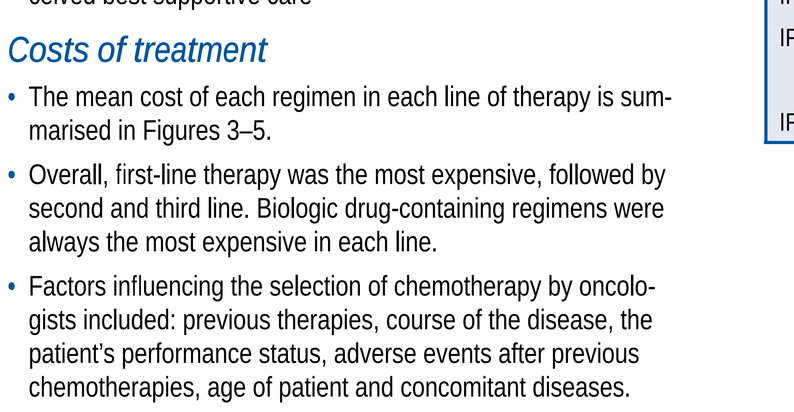


Figure 4. Total cost of regimens per patient in second-line therapy

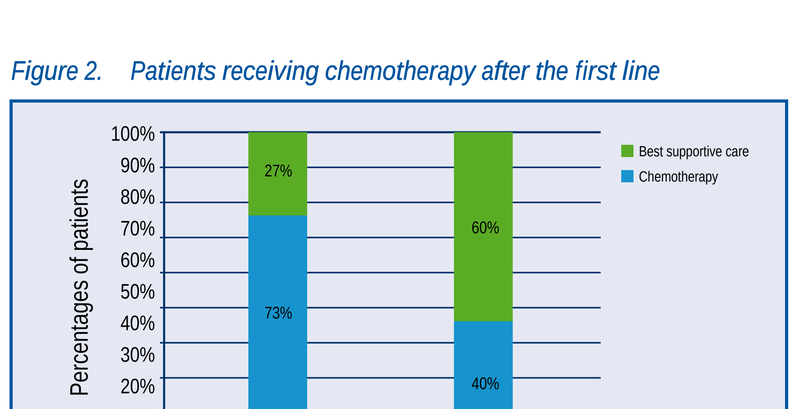
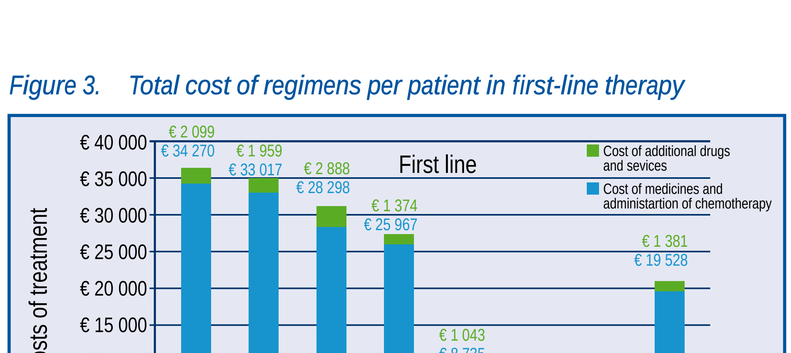


Figure 5. Total cost of regimens per patient in third-line therapy



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