TITLE: Adjuvant and Neoadjuvant Chemotherapy and Radiation for the Treatment of Rectal Cancer: Economic Evidence

DATE: 06 November 2013

RESEARCH QUESTION

What is the evidence for the costs associated with adjuvant and neoadjuvant chemotherapy and radiation therapy for the treatment of rectal cancer in Canada?

KEY MESSAGE

One economic evaluation was identified regarding the costs associated with adjuvant and neoadjuvant chemotherapy and radiation therapy for the treatment of rectal cancer in Canada.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2013, Issue 10), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No methodological filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2002 and October 24, 2013. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, and economic evaluations.
One economic evaluation was identified regarding the costs associated with adjuvant and neoadjuvant chemotherapy and radiation therapy for the treatment of rectal cancer. No relevant health technology assessments, systematic reviews, meta-analyses, or randomized controlled trials were identified. Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

One economic evaluation\(^1\) estimated the costs associated with treatment for the 21 most common types of cancer in Ontario, including colorectal cancer. No information regarding the costs associated with colorectal cancer is presented in the abstract but more specific information is available within the full-text publication.
REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses
No literature identified.

Randomized Controlled Trials
No literature identified.

Economic Evaluations


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APPENDIX – FURTHER INFORMATION:

Cost Studies

Thesis

2. Ewara E. The cost-effectiveness of combination treatment consisting of either cetuximab or panitumumab plus folfiri versus bevacizumab plus folfiri as first-line treatment for kras wildtype metastatic colorectal cancer patients in Ontario [Internet]. London, Ontario: The University of Western Ontario; 2012. [cited 2013 Nov 5]. Available from: http://ir.lib.uwo.ca/cgi/viewcontent.cgi?article=2241&context=etd

Non-Canadian studies


BACKGROUND AND OBJECTIVE: The increasing cost of chemotherapy is placing greater pressures on limited healthcare budgets. A potentially important, but often overlooked, aspect of chemotherapy is the cost associated with administration. This study aims to develop a better understanding of these costs, and in doing so, develop a model to estimate the comparative cost of administering alternative chemotherapy protocols for economic evaluation or local decision making.

METHODS: We identified the potential tasks and choices related to administering intravenous chemotherapy, grouped tasks according to anticipated resource use, and allocated costs to each task using data from an evidence-based collection of cancer protocols or from primary data collection. The resources were costed from a healthcare system perspective using standard data sources within Australia. The model was applied to alternative protocols used in the treatment of three different cancers: locally advanced and metastatic non-small-cell lung cancer, adjuvant colorectal cancer and adjuvant breast cancer. Results: For the three cancer types examined, the cost of completed administration ranged from 1274 Australian dollars ($A) to $A3015 (year 2009 values) for 13 different protocols potentially used for the initial treatment of locally advanced and metastatic non-small-cell lung cancer; $A5175-8445 for seven protocols for adjuvant colorectal cancer treatment; and $A1494-4074 for seven protocols for adjuvant breast cancer treatment. CONCLUSIONS: The results are of practical significance to those undertaking economic evaluations and to decision makers who use this information within the area of chemotherapy. The examples used suggest that administration costs per visit varied inversely with the number of visits. The results provide information where little has previously been available and may allow decisions about costs and resource allocation to be made with more certainty. Although our model uses costs from the public health system within an Australian state (New South Wales), it can be adapted for use in other jurisdictions.


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OBJECTIVE: Management options for colorectal cancer have expanded in recent years. We estimated average lifetime cost of care for colorectal cancer in Ireland in 2008, from the health care payer perspective. METHOD: A decision tree model was developed in Microsoft EXCEL. Site and stage-specific treatment pathways were constructed from guidelines and validated by expert clinical opinion. Health care resource use associated with diagnosis, treatment and follow-up were obtained from the National Cancer Registry Ireland (n=1,498 cancers diagnosed during 2004-2005) and three local hospital databases (n=155, 142 and 46 cases diagnosed in 2007). Unit costs for hospitalisation, procedures, laboratory tests and radiotherapy were derived from DRG costs, hospital finance departments, clinical opinion and literature review. Chemotherapy costs were estimated from local hospital protocols, pharmacy departments and clinical opinion. Uncertainty was explored using one-way and probabilistic sensitivity analysis. RESULTS: In 2008, the average (stage weighted) lifetime cost of managing a case of colorectal cancer was €39,607. Average costs were 16% higher for rectal (€43,502) than colon cancer (€37,417). Stage I disease was the least costly (€23,688) and stage III most costly (€48,835). Diagnostic work-up and follow-up investigations accounted for 4 and 5% of total costs, respectively. Cost estimates were most sensitive to recurrence rates and prescribing of biological agents. CONCLUSION: This study demonstrates the value of using existing data from national and local databases in contributing to estimating the cost of managing cancer. The findings illustrate the impact of biological agents on costs of cancer care and the potential of strategies promoting earlier diagnosis to reduce health care resource utilisation and care costs.


The aim of this study was to evaluate the cost-effectiveness of carbon ion radiotherapy compared with conventional multimodality therapy in the treatment of patients with locally recurrent rectal cancer. Direct costs for diagnosis, recurrent treatment, follow-up, visits, supportive therapy, complications, and admission were computed for each individual using a sample of 25 patients presenting with local recurrent rectal cancer at the National Institute of Radiological Science (NIRS) and Gunma University Hospital (GUH). Patients received only radical surgery for primary rectal adenocarcinoma and had isolated unresectable pelvic recurrence. Fourteen and 11 patients receiving treatment for the local recurrence between 2003 and 2005 were followed retrospectively at NIRS and GUH, respectively. Treatment was carried out with carbon ion radiotherapy (CIRT) alone at NIRS, while multimodality therapy including three-dimensional conformal radiotherapy, chemotherapy, and hyperthermia was performed at GUH. The 2-year overall survival rate was 85% and 55% for CIRT and multimodality treatment, respectively. The mean cost was ¥en4 803 946 for the CIRT group and ¥en4 611 100 for the multimodality treatment group. The incremental cost-effectiveness ratio for CIRT was ¥en6428 per 1% increase in survival. The median duration of total hospitalization was 37 days for CIRT and 66 days for the multimodality treatment group. In conclusion, by calculating all direct costs, CIRT was found to be a potential cost effective treatment modality as compared to multimodality treatment for locally recurrent rectal cancer.

Recently, the National Surgical Adjuvant Study of Colorectal Cancer in Japan, a randomised controlled trial of oral uracil-tegafur (UFT) adjuvant therapy for stage III rectal cancer, showed remarkable survival gains, compared with surgery alone. To evaluate value for money of adjuvant UFT therapy, cost-effective analysis was carried out. Cost-effectiveness analysis of adjuvant UFT therapy was carried out from a payer’s perspective, compared with surgery alone. Overall survival and relapse-free survival were estimated by Kaplan-Meier method, up to 5.6 years from randomisation. Costs were estimated from trial data during observation. Quality-adjusted life-years (QALYs) were calculated using utility score from literature. Beyond observation period, they were simulated by the Boag model combined with the competing risk model. For 5.6-year observation, 10-year follow-up and over lifetime, adjuvant UFT therapy gained 0.50, 0.96 and 2.28 QALYs, and reduced costs by $2457, $1771 and $1843 per person compared with surgery alone, respectively (3% discount rate for both effect and costs). Cost-effectiveness acceptability and net monetary benefit analyses showed the robustness of these results. Economic evaluation of adjuvant UFT therapy showed that this therapy is cost saving and can be considered as a cost-effective treatment universally accepted for wide use in Japan.


BACKGROUND: In industrialized countries, colorectal cancer is a leading cause of morbidity and mortality. Decisions on colorectal cancer screening are based on cost-effectiveness analyses that rely on colorectal cancer cost studies. Additionally, the study of the resource utilization pattern may lead to cost-saving strategies in the care of colorectal cancer. AIM: To estimate hospital resource utilization, the use of various therapy modalities and costs of colorectal cancer cases undergoing surgery during the first 3 years following the diagnosis at a Swiss university hospital. METHODS: Consecutive colorectal cancer patients from 1997 to 1998 were identified using the surgery database of the University Hospital of Basel and followed for a period of 3 years. In-hospital resource utilization and costs were retrieved from the computerized administrative records. Treatment outside of the hospital during the study period constituted an exclusion criterion. RESULTS: Eighty-three (94%) of 89 patients undergoing surgery for colorectal cancer were included in the study, 58 with colon cancer and 25 with rectal cancer. The average ages were 70.3 and 63.6 years, respectively. Overall, 59% of the patients were treated with surgery alone, 27% also had chemotherapy and 15% received additional chemoradiotherapy. These percentages and resource utilization varied broadly between the two colorectal cancer groups. On average, patients were admitted to the hospital 2.7 times and the hospital length of stay amounted to 35 days. They were visited by doctors 69 times, and examined with colonoscopy, ultrasonography and computerized tomography 2.7, 3.2 and 2.4 times, respectively. Mean costs incurred for rectal cancer (US dollars 40,230) were about 22% higher than for...
colon cancer patients (US dollars 33,079). Hospitalization and surgical therapy generated the greatest costs. Expenses were highest for the first year and with more severe disease stages at diagnosis. CONCLUSIONS: Colorectal cancer is an expensive disease. Economic analyses on screening should take into account the large resource utilization and cost variability by performing sensitivity analysis on broad cost ranges. Furthermore, they should consider stage shifting at diagnosis and include stage-specific costs.

Additional References


