Cost-effectiveness of palliative chemotherapy in advanced gastrointestinal cancer

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Chemotherapy in advanced gastrointestinal cancer.

Type of intervention
Treatment/palliative care.

Economic study type
Cost-effectiveness analysis.

Study population
Patients below the age of 76 years with surgically non-curable gastric, pancreatic-biliary or colorectal cancer.

Setting
Hospital. The study was carried out in Uppsala, Sweden.

Dates to which data relate
Data for the effectiveness analysis corresponded to the period January 1991-June 1994. The data for resource usage corresponded to the same period. 1992 prices were used.

Source of effectiveness data
Single study.

Link between effectiveness and cost data
The costing was undertaken in the same patient sample as that used in the effectiveness study. The economic costs were prospectively recorded.

Study sample
Survival differences were tested according to the Breslow Gehan generalization of the Wilcoxon test. With a total of 60 patients it was possible to detect a median survival difference of 8 months. From 4 to 12 months alpha= 0.05 and 1-beta = 0.8. From 76 individuals initially informed of the study, 15 (20%) did not wish to participate. Of the 61 patients participating, 33 were allocated to the primary chemotherapy group and 28 to the best supportive care group.

Study design
The study was a single centre randomized controlled trial with patients allocated to either primary chemotherapy including best supportive care or to best supportive care whereby chemotherapy was allowed if the supportive measures
did not result in palliation. Duration of follow-up was 42 months (January 1991-June 1994). There was no loss to follow up. The subject allocation method was stratified allocation. Blinding method on assessor of patients’ outcome.

Analysis of effectiveness
Analysis was based on intention to treat. The primary health outcomes used were survival time, toxicity and quality of life. The pre-treatment characteristics of the patients were well-balanced between the groups. Radiotherapy was recognized to be given earlier in the best supportive care group.

Effectiveness results
Gained days of survival, life-years gained, quality-adjusted days of life (QALDs) and quality-adjusted life years (QALYs). The method of valuation of quality of life was direct measurement through questionnaires. The values used to assess the health states were provided by two observers and a research nurse. The valuation was carried out every two months starting from the date of randomization.

Measure of benefits used in the economic analysis
Gained days of survival, life-years gained, QALDs and QALYs. The method of valuation of quality of life was direct measurement through questionnaires. The values used to assess the health states were provided by two observers and a research nurse. The valuation was carried out every two months starting from the date of randomization.

Direct costs
Quantities and costs were not separated. They included drug costs, and its administration, radiotherapy, surgery, outpatient visits, hospitality section (overhead and operating costs were measured). The cost estimate was based on actual data from the sample. The cost source was the departments of Surgery and Oncology of Uppsala University. The quantity of resources used was measured from January 1991 to June 1994. 1992 prices were used.

Statistical analysis of costs
Average costs and their standard deviations were reported.

Currency
Swedish Kroner(SEK). No conversion was reported.

Sensitivity analysis
Analysis was carried out based on different assumptions about effectiveness and cost data (or assumptions about alternative administration and hospitalization routines). The generalisability of results was investigated. The method used was one-way simple sensitivity analysis.

Estimated benefits used in the economic analysis
Overall, 19 (58%) patients had favourable quality of life outcomes in the primary chemotherapy group compared to 8 (29%) in the best supportive care group (p<0.05). In the best supportive care group, the outcomes in 3 of the 8 quality of life patients were attributed to chemotherapy. In the remaining patients it was caused by radiotherapy in one patient and by “naturally prolonged asymptomatic periods” in the others. The average quality adjusted survival was longer in the group of patients randomized to primary treatment than in the best-supportive-care group (median 7 vs 2 months, p<0.05).

Cost results
The costs for hospitalization dominated the total costs in both groups, but with somewhat higher proportion in the best-
supportive-care group. All costs associated with chemotherapy (drugs and administration) accounted for 22% of the total cost in the primary chemotherapy group and 11% in the best-supportive-care group. In the primary chemotherapy group this proportion was higher in gastric cancer (30%) than in pancreatic-biliary cancer (18%) and colorectal cancer (12%). The average total cost +/- SD per patient was SEK 143,100 (+/- 134,100) in the primary chemotherapy group and SEK 96,600 (+/- 91,500) in the best-supportive group.

**Synthesis of costs and benefits**
In the primary chemotherapy and best-supportive-care groups, the average total costs per day were SEK 487 and SEK 503 respectively. The average total cost per QALD was SEK 669 and SEK 910 respectively. In the primary chemotherapy group, the incremental cost per gained day was SEK 457, the incremental cost per gained life year was SEK 166,400, the incremental cost per gained QALD was SEK 431 and the incremental cost per gained QALY was SEK 157,200.

The incremental costs were sensitive to changes in survival differences. The incremental cost per year of life for different cancers ranged as follows:
- gastric cancer: 105,500-84,400 SEK,
- colorectal cancer: 204,000-102,000 SEK and
- pancreatic/biliary cancer: infinity - 189,00 SEK.

**Authors' conclusions**
The results suggest that palliative chemotherapy is cost-effective in patients with advanced gastric and colorectal cancer. Knowledge about survival and quality of life benefits is still limited in patients suffering from gastric and pancreatic-biliary cancer.

**CRD Commentary**
This was a good economic evaluation carried out in accordance with the generally accepted methodological principles.

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**Other publications of related interest**

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