Routine perioperative chemotherapy instillation with initial bladder tumor resection: a reconsideration of economic benefits

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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.

CRD summary
This study assessed the economic implications of routine perioperative instillation chemotherapy, during a first transurethral resection, for patients with non-muscle-invasive bladder cancer. The authors concluded that routine instillation was cost-saving, compared with no instillation, in an in-patient setting, but there were fewer savings with out-patient treatment, and fulguration in an office setting was more cost-saving. There were a number of limitations to the methods and analysis, and the authors’ conclusions should be viewed with caution.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The aim was to assess the economic implications of routinely instilling intravesical chemotherapy, during the first transurethral resection, for patients with non-muscle-invasive bladder cancer, of any tumour grade.

Interventions
Routine perioperative instillation of chemotherapy, using mitomycin C (40mg), to manage the recurrence of tumours, with subsequent transurethral resections as needed, was compared with management by transurethral resections alone. Three delivery settings for transurethral resections were compared: hospital in-patient, hospital out-patient, and surgical centre out-patient. These were compared with fulguration (high-frequency electric current) in the general practitioner office.

Location/setting
USA/in-patient care.

Methods
Analytical approach:
Outcome estimates, from a meta-analysis, and cost data, from published literature, were combined to produce cost and effectiveness estimates. The authors did not state the perspective nor the analytic time frame.

Effectiveness data:
The clinical data were from a selection of randomised controlled trials published between 1993 and 2002. These trials were identified in a published meta-analysis (Sylvester, et al. 2004, see ‘Other Publications of Related Interest’ below for bibliographic details) and the data were re-analysed to include some excluded patient populations. The clinical estimates were the number needed to treat (NNT) to prevent a recurrence and the recurrence rate.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
The measure of benefit was the NNT.

Cost data:
The resource types, for the direct costs of medical care, were chemotherapy drug and administration, transurethral
resection and management of recurrences as an in-patient or out-patient, in hospital or a surgical centre, and fulguration in the office setting. These were valued using Current Procedural Terminology fee schedules and US Medicare reimbursements. The costs of mitomycin C were from the authors’ institution. The unit costs for some resources were presented in the text and the total costs for each resource category were given, for each setting, in US dollars ($).

Analysis of uncertainty:
None reported.

Results
The re-analysis of the trial data found that the NNT was between 8.5 and 9.6 patients. This means that for every 8.5 to 9.6 patients with non-muscle-invasive bladder cancer, who had routine perioperative instillation chemotherapy, one did not have a recurrence of tumours. The additional cost of the chemotherapy, depending on the NNT, ranged from $1,711 to $1,932 for a hospital in-patient, $1,867 to $2,109 for a hospital out-patient, and $1,632 to $1,843 for a surgical centre out-patient.

Using the NNT of 8.5, for routine chemotherapy to be cost-saving, the cost of a transurethral resection would have to be more than the lower additional cost of chemotherapy. The cost of a transurethral resection was $7,025 for a hospital in-patient, $2,666 for a hospital out-patient, and $2,113 for a surgical centre out-patient. The cost of an office fulguration was $1,167. Routine perioperative instillation was cost-saving, compared with transurethral resection, for hospital in-patients and cost-saving to a much lesser extent, in the two out-patient settings, while office fulguration saved more costs.

Using the less-conservative NNT estimate of 9.6, the cost-saving results were the same.

Authors’ conclusions
The authors concluded that routine perioperative chemotherapy instillation, during primary transurethral resection, for patients with bladder cancer was cost-saving, compared with no perioperative chemotherapy, in an in-patient setting, but there were fewer savings with out-patient treatment, and fulguration in an office setting was most cost-saving.

CRD commentary
Interventions:
The alternative settings were briefly described and the dose of the chemotherapy and the patient population were described. These alternative delivery options might be relevant in other settings.

Effectiveness/benefits:
The effectiveness data were from a selection of relevant clinical trials. These data were re-analysed to include all patients regardless of disease severity. The original studies should be consulted to assess whether they were valid and had representative health outcomes. The original meta-analysis should be assessed to decide whether all the best available information was included. No statistical analysis of the pooled NNT estimate was undertaken and bias and study heterogeneity were not considered. The NNT was assumed to be the same in the different delivery settings. The benefits were not discounted and the time horizon was not reported, which makes it impossible to know whether this was appropriate.

Costs:
The average Current Procedural Terminology costs for transurethral resection or fulguration, recurrence management, and drugs were the only resources analysed and it was unclear if the inclusion of other direct health resources, such as complications, follow-up visits, and resources arising from drug toxicities, could have influenced the findings. The price year was not reported and it is unclear if the costs should have been adjusted for inflation. The time horizon was not stated, which makes it unclear whether discounting of costs was appropriate.

Analysis and results:
The cost and health outcomes were not combined into incremental cost-effectiveness ratios and a cost-consequences analysis was undertaken. There were no sensitivity analyses to examine the stability of the base estimates and to reduce the uncertainty of the authors’ conclusions. The authors acknowledged some study limitations including the reliance on
US Medicare costs that may vary by Medicare carrier, and the omission of a more comprehensive cost analysis following recurrence.

Concluding remarks:
There were a number of limitations to the study methods and a basic economic analysis, and the authors’ conclusions should be viewed with caution.

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