Survival outcome and cost-effectiveness with docetaxel and paclitaxel in patients with metastatic breast cancer: a population-based evaluation
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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
The aim was to compare the cost-effectiveness of docetaxel with that of paclitaxel for the palliative treatment of metastatic breast cancer in patients with prior exposure to anthracycline. The authors concluded that docetaxel was a cost-effective alternative to paclitaxel from the perspective of the Canadian provincial health service payer. Although based on a weak clinical source and limited reporting of the economic data, the study met the authors’ objective. However, the conclusions should be treated with caution.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The aim was to compare the cost-effectiveness of docetaxel with that of paclitaxel for the palliative treatment of metastatic breast cancer (MBC) in patients with prior exposure to anthracycline.

Interventions
The two taxane-based therapies for the management of patients with MBC were paclitaxel and docetaxel. Both were given intravenously every three weeks, paclitaxel at a dosage of 175mg/m\(^2\) and docetaxel at a dosage of 100mg/m\(^2\).

Location/setting
Canada/hospital.

Methods
Analytical approach:
This economic evaluation was based on data derived from a single source (i.e., an administrative database). The time horizon was less than one year because of the poor survival of patients. The authors stated that the perspective of the health service payer was adopted.

Effectiveness data:
The clinical data were obtained from a Canadian provincial cancer registry, namely the British Columbia Cancer Agency. The number of patients required was determined on the basis of power calculations. There were 190 patients, with a median age of 56 years, in the paclitaxel group and 245 patients, with a median age of 54 years, in the docetaxel group. The two groups of patients were similar with respect to key demographic and clinical factors. The key clinical outcome was overall survival (OS), which was defined as the time from initiation of therapy to death by any cause.

Monetary benefit and utility valuations:
None.

Measure of benefit:
Life-years gained were the summary benefit measure which was calculated on the basis of OS.

Cost data:
The health service costs were drugs, labour, and supplies, which were calculated using a previous costing template, the details of which were not given. The costs were in Canadian dollars (CAD) and the price year was not reported.
Analysis of uncertainty: 
A deterministic sensitivity analysis was undertaken in which costs were varied to the extremes of the range of treatment cycles, while effectiveness was varied to the extremes of the 95% confidence interval (CI) as determined by the clinical analysis.

Results
The median cost per patient was CAD 9,441 with docetaxel and CAD 2,944 with paclitaxel. This difference was mainly due to the higher cost per treatment cycle and the higher number of cycles received of docetaxel (4.3) compared with paclitaxel (3.5).

The median OS was 10.91 (95% CI: 9.19, 12.62) in the docetaxel group and 8.34 (95% CI: 7.04, 9.65) in the paclitaxel group.

The incremental cost per life-year (LY) gained with docetaxel over paclitaxel was CAD 30,337. When data were extrapolated to a five-year horizon, the incremental cost per LY gained with docetaxel was CAD 20,919.

The sensitivity analysis indicated that the base-case findings were robust, except in a few extreme scenarios. Paclitaxel was dominant (simultaneously more effective and less expensive) when the low end of the CI of median OS for docetaxel was compared with the high end of the CI of median OS for paclitaxel. When the cost was varied, the incremental cost-effectiveness ratio ranged from dominant to CAD 80,005. In general, the incremental cost-effectiveness ratio ranged from CAD 13,972 to CAD 91,724.

Authors' conclusions
The authors concluded that, from the perspective of the Canadian provincial health service payer, docetaxel was a cost-effective alternative to paclitaxel for the management of patients with MBC.

CRD commentary
Interventions:
The authors stated that taxanes are the standard treatment for MBC, and that both therapies under examination had similar chemical structures and anti tumour effects, but different haematologic toxicity. These were chosen because they were more effective than other agents such as gemcitabine and vinorelbine. They are likely to be relevant therapies in many other settings.

Effectiveness/benefits:
Clinical data were derived from an administrative database, which reflects the clinical endpoints in a real-world setting, although its retrospective nature may represent a limitation to its validity. Furthermore, the clinical analysis was not created for the purpose of the study and may not have been the most appropriate source of data. Nevertheless, it represents an official database, which follows strict criteria, and study groups were well balanced at baseline, thus enhancing the validity of the comparison. LYs gained or OS as the summary benefit measure is widely used in chemotherapy studies, although a quality-adjustment would have been useful given the impact of the therapies on both length and quality of life. However, the authors noted that a recent study showed no difference in global quality of life scores.

Costs:
The categories of costs were consistent with the study perspective. Unit costs and quantities of resources used were not presented separately. The costs were derived from published sources with the same first author as this study. However, the methodology of the previous work was not described, which means that it is not possible to assess the validity of the economic analysis. Furthermore, statistical analyses of costs were not performed. Finally, the price year was not reported, which limits the possibility of making reflation exercises.

Analysis and results:
The synthesis of costs and benefits was appropriately performed and reported. The issue of uncertainty was addressed by means of a deterministic sensitivity analysis, in which model inputs were varied individually. The results of these analyses were clearly presented. The authors stated that the current study was the first population-based study to
confirm the findings from a recent randomised clinical trial.

Concluding remarks:
Although based on a weak clinical source, and subject to limited reporting of the economic analysis, the study met the authors' objective. The authors' conclusions should be treated with some caution.

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