Cost and effectiveness of exenatide combined with insulin, compared to exenatide combined with oral hypoglycaemic agents

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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 study objective was to compare the cost-effectiveness of exenatide treatment in patients with tablet-treated or insulin-treated type 2 diabetes. The authors concluded that exenatide was more cost-effective in those treated with insulin than those treated with oral hypoglycaemic agents. The study methodology quality was poor. The analysis was based on a before-and-after study in which a small number of patients were identified retrospectively, so the results should be treated with caution.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
To compare the efficacy and relative cost of treatment with exenatide in patients with tablet-treated or insulin-treated type 2 diabetes.

Interventions
The study assessed use of exenatide in patients with tablet-treated or insulin-treated type 2 diabetes. Outcomes and cost were compared to baseline levels when patients were not given exenatide.

Location/setting
UK/Secondary care (hospital).

Methods
Analytical approach:
Outcome and cost information were derived from a single retrospective study of patients with type 2 diabetes. The time horizon of the study was six months. The perspective adopted in the economic analysis was not explicitly reported.

Effectiveness data:
The study was a retrospective analysis of patients recruited from a single hospital diabetes centre in England. Patients were selected for treatment with exenatide if they were receiving oral hypoglycaemic agents (OHAs) or insulin due to poor control with OHAs. Study participants all completed six months of treatment. Two hundred and seven patients completed six months of treatment with exenatide, 188 of whom were advised to continue treatment. One hundred of these 188 patients were on OHAs and 88 were on insulin. Outcome data were derived from the West Suffolk Hospital diabetes database. Effectiveness was measured as changes in HbA1c, weight and body mass index (BMI) between baseline and six months.

Monetary benefit and utility valuations:
None.

Measure of benefit:
Changes in HbA1c, weight and BMI between baseline and six months.

Cost data:
The direct costs included in the study related to medications. Medication costs were estimated using prices from the NHS Economic Evaluation Database (NHS EED) produced by the Centre for Reviews and Dissemination. Copyright © 2019 University of York.
British National Formulary (Edition 61). The price year was not reported explicitly. All costs were reported in UK pounds sterling (£).

Analysis of uncertainty:
Statistical differences between baseline and six-month estimates were assessed using t-tests.

Results
For the 88 patients taking exenatide with insulin the mean reduction change between baseline and six months was: -1.6 (95% CI -3.0 to -0.2; p<0.0001) in HbA1c levels, -7.3kg (95% CI -12.5 to -2.1; p<0.0001) in weight and -2.6 (95% CI -4.5 to -0.7; p<0.0001) BMI units.

For the 100 patients taking exenatide with OHAs the mean reduction change between baseline and six months was -1.6 (95% CI -3.4 to 0.2; p<0.0001) in HbA1c levels, -6.5kg (95% CI -12.0 to -1.0; p<0.0001) in weight and -2.2 (95% CI -4.1 to -0.3; p<0.0001) BMI units.

In the group treated with exenatide and OHAs, medication costs decreased by an average of £13.34. In the group treated with exenatide and insulin, medication costs decreased by an average of £32.04.

Authors' conclusions
The authors concluded that exenatide was more cost-effective in patients originally treated with insulin than in those originally treated with oral hypoglycaemic agents.

CRD commentary

Interventions:
The interventions under study were reported adequately. The rationale for selection of comparators was clear as they represented relevant treatments in the authors setting (recommended for use by the National Institute of Health and Clinical Excellence or supported by a recent large UK national survey).

Effectiveness/benefits:
The clinical evidence was from a small retrospective cohort study that evaluated changes in HbA1c levels, weight and BMI six months before and after treatment with exenatide. This type of study design is open to bias including potential for inclusion bias and the fact that external factors (such as better standards of care over the six months of the study) could have confounded the results. The 95% confidence interval for change in HbA1c levels for patients taking exenatide with OHAs overlapped with zero but the authors still reported a statistical difference of p<0.0001.

Costs:
A very limited costing study was undertaken by the authors in which only the costs of medications were included. Given that the authors reported that exenatide was effective in reducing patients' weight and HbA1c levels, it was possible that exenatide would have resulted in lower health care costs due to improved health in patients. Consequently, it was possible that not all relevant costs were included in the study. The price year was not reported and this may hinder further inflation exercises.

Analysis and results:
Cost and outcome data were derived from a small retrospective study. Differences in outcome between baseline and six months were compared using t-tests. Errors in the significance results presented were likely. Despite numerous limitations of the study, the authors reported no limitations.

Concluding remarks:
The quality of the study methodology was poor. The analysis was based on a before-and-after study in which a small number of patients were identified retrospectively, so the results should be treated with caution.

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