Cost-effectiveness analyses of the conversion of patients with non-insulin-dependent diabetes mellitus from glipizide to glyburide and of the accompanying pharmacy follow-up clinic


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
Treatment for non-insulin-dependent diabetes mellitus. In particular: (1) glipizide therapy; (2) glyburide therapy; (3) glyburide therapy and the accompanying pharmacy follow-up clinic.

Type of intervention
Secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with non-insulin dependent diabetes mellitus, of whom 98.5% were men, with average age 65.11 (+

Setting
Primary care/pharmacist setting. The economic study was carried out in Ohio, USA.

Dates to which data relate
The effectiveness and resource data related to 1993.1994 prices were used.

Source of effectiveness data
The effectiveness data was derived from a single study.

Link between effectiveness and cost data
The costing was undertaken on the same patient sample as that used in the effectiveness study. The costing was undertaken retrospectively.

Study sample
A total study sample size of 730 patients constituted the group 1 patients treated with glipizide originally. Of this group 408 patients switched to glyburide and attended the follow-up clinic (group 2) and 244 switched to glyburide but did not attend the follow-up clinic (group 3). 78 patients were excluded, because records were missing. Power calculations did not determine the sample size.

Study design
Non-randomized trial with concurrent controls; single centre study. There was no loss to follow-up.
Analysis of effectiveness
The analysis was based on intention to treat. The primary health outcomes used in the analysis were the percentage of patients who achieved good glycemic control (<140mg/dL) and side-effects due to the therapy of group 2 and 3. At analysis patients were shown to be comparable in age, sex, and prognostic features.

Effectiveness results
32% of patients in group 2 had good glycemic control, compared to 24% in group 1 and 20% in group 3. The mean daily dose of glipizide was significantly different from the mean daily dose for glyburide.

One patient was allergic to glyburide, and 14 others suffered adverse side-effects which were not considered to be serious. 1 patient was hospitalized, and 4 switched from oral anti-diabetic drugs to insulin.

Clinical conclusions
Patients who were switched from glipizide to glyburide, accompanied by a pharmacy follow-up clinic achieved a higher level of effectiveness.

Measure of benefits used in the economic analysis
The percentage of patients with good glycemic control and side-effects due to the therapy.

Direct costs
Costs and quantities were reported separately. Costs were calculated for the conversion and the clinic. Information was collected on: medication (daily dose and number of tablets); the number of fasting blood glucose (FBG) tests performed for the conversion; the number of physician and pharmacist visits during the conversion. The data was provided by the chief of pharmacy at the Columbus VA. For patients who did not attend the pharmacy follow-up clinic, this information was obtained by examining the VA computer database. The boundary adopted was the health service.

1994 prices were used. Costs common to all groups (for example routine physician visits) were excluded.

Statistical analysis of costs
A statistical analysis of costs was carried out on the data, but no specifications other than a 0.05 significance level, and standard deviation (+/-) of results was mentioned.

Currency
US dollars ($).

Sensitivity analysis
A sensitivity analysis was undertaken on both the effectiveness measure, and the cost-effectiveness of the conversion. Patients with FBG <200mg/dL were considered to have good glycemic control. No other information is given.

Estimated benefits used in the economic analysis
Using the effectiveness measure, 32% of patients in group two had good glycemic control, compared to 24% in group 1, and 20% in group 3. One patient was allergic to glyburide and 14 others suffered adverse side-effects which were not considered to be serious. 1 patient was hospitalized and 4 switched from oral anti-diabetic drugs to insulin.
Cost results
For each group the acquisition cost per year, per patient was:

- group 1 = $226.30
- group 2 = $147.61
- group 3 = $135.52.

The effects on costs of adverse side-effects could not be estimated.

Synthesis of costs and benefits
Cost-effectiveness was defined as the ratio of total costs per patient to the effectiveness measure. Group 1 had a cost-effectiveness ratio of $9.43, group 2 of $4.61, and group 3 of $6.78.

An incremental analysis was performed between groups 2 and 3. The incremental cost for every additional 1% of patients in group 2, was $1.01.

Authors' conclusions
The conversion from glipizide to glyburide was cost-effective. Overall the costs of group 3 were found to be the lowest. However, conversion accompanied by a follow-up clinic (group 2) was found to be more effective in achieving good glycemic control. The cost of the follow-up clinic was found to be justified by the added benefits.

CRD Commentary
This is a simple and well-reported study. However:

1. Patients were not randomly assigned to groups, which may introduce bias.
2. More details about the sensitivity analysis would have been useful.
3. The impact of side-effects was considered neither on the final benefits nor on total costs.

Moreover, the authors recognised the problems associated with data collection, the setting of the study, and the failure to investigate the effects of variables such as diet and exercise.

Implications of the study
1. The authors noted that future work could examine the long-term effects of the conversion and follow-up clinic.
2. A well-designed randomized control trial may be required.

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