Orlistat for the treatment of obesity: rapid review and cost-effectiveness model
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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.

Health technology
The use of orlistat (Xenical), at a dose of 120 mg three times a day, for the treatment of obesity. There was no comparator technology.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The target population was patients suffering from obesity who were included in a trial of orlistat.

Setting
The setting was the community. The study was carried out in the UK.

Dates to which data relate
The effectiveness data were gathered from studies published in 1998 and 1999. The dates during which the cost data were collected were not reported. The price year was 1998.

Source of effectiveness data
The effectiveness and resource data were obtained from a review and synthesis of published studies, supplemented with authors’ assumptions.

Outcomes assessed in the review
The outcomes assessed in the review were:

the absolute risk reduction (ARR);
the number needed to treat (NNT) for a 5 or 10% loss of initial body weight; and
the relative change in fasting plasma insulin.

The authors also described some results from different studies.

Study designs and other criteria for inclusion in the review
Systematic reviews and randomised controlled trials were considered for inclusion in the review. Only studies of
humans were included.

**Sources searched to identify primary studies**
MEDLINE, Pre-MEDLINE, EMBASE and the Cochrane Library were searched. The primary search terms were "orlistat", "tetrahydrolipistatin", "RO 18-0647" and "Xenical". The secondary search terms were "anti-obesity treatment" and "anti-obesity drug".

**Criteria used to ensure the validity of primary studies**
A single researcher reviewed the abstracts and ordered only randomised controlled trials or systematic reviews of randomised controlled trials.

**Methods used to judge relevance and validity, and for extracting data**
A single reviewer assessed the studies for inclusion and extracted the data.

**Number of primary studies included**
Three primary studies were identified.

**Methods of combining primary studies**
The results from the primary studies were not combined.

**Investigation of differences between primary studies**
The authors highlighted differences between the studies, such as the length of time over which the outcomes were observed and the primary outcome assessed (e.g. 5 or 10% body weight loss).

**Results of the review**
For a 5% loss of body weight, the ARR for orlistat plus diet compared with placebo plus diet was 17.5% (95% confidence interval, CI: 7.4 - 27.3). The NNT was 6 (95% CI: 4 - 14).

For a 10% loss of body weight, the ARR for orlistat plus diet compared with placebo plus diet was 8.6% (95% CI: 2.7 - 14.8). The NNT was 12 (95% CI: 7 - 37).

The two-year change in fasting plasma insulin levels ranged from -17.5 to -25.6 pmol/L for the orlistat group, and from -0.05 to -3.0 pmol/L for the placebo group.

**Methods used to derive estimates of effectiveness**
The authors made assumptions to supplement the effectiveness estimates.

**Estimates of effectiveness and key assumptions**
Since the results from the review were not based on intention to treat principles, the authors reanalysed their results on this basis. This required some assumptions concerning the cause of withdrawal.

**Measure of benefits used in the economic analysis**
The summary measure of benefit was the quality-adjusted life-years (QALYs). The quality of life estimates were derived using a procedure developed by the Wessex Development and Evaluation Service (see Other Publications of Related Interest). Two experts (a clinician in obesity treatments and an obesity researcher) estimated and confirmed
these estimates.

Direct costs
A perspective for the costing was not reported. The time horizon was one year, therefore discounting was not required. The authors were concerned with costs such as patient consultations, orlistat and consultations with general practitioners. The unit costs were derived using actual figures taken from a "local" National Health Service Trust. The source of the quantities, such as the number of consultations, was unclear. The price year was 1998.

Statistical analysis of costs
The costs were treated deterministically.

Indirect Costs
The authors did not report that any indirect costs were included in the analysis. These may have been relevant if consultations required time away from work, which has productivity implications.

Currency
UK pounds sterling (€).

Sensitivity analysis
Multi-way and extreme values sensitivity analyses were carried out, but the parameters varied were not reported.

Estimated benefits used in the economic analysis
If 100 patients were treated with orlistat for one year they would gain 1.60 QALYs.

Cost results
If 100 patients were treated with orlistat for one year the base-case cost would be 73,436.

Synthesis of costs and benefits
Orlistat treatment for one year cost 45,881 per QALY gained.

The multi-way sensitivity analysis gave a cost-effectiveness range of 19,452 to 55,391 per QALY gained. The extreme values sensitivity analysis gave a cost-effectiveness range of 13,541 to 131,918 per QALY gained.

The authors stated that full details of the sensitivity analyses were reported elsewhere (see Other Publications of Related Interest).

Authors' conclusions
Orlistat may be effective in reducing weight for some obese people. The authors did not draw any conclusions on the costs, owing to the lack of similar data with which to draw comparisons.

CRD COMMENTARY - Selection of comparators
The authors compared orlistat with placebo to assess the active value of orlistat. It was unclear whether orlistat was currently in use in the authors' setting.
Validity of estimate of measure of effectiveness
The authors reported that a rapid review was carried out. This involved a thorough search of the relevant literature, appropriate steps to ensure the validity of the papers included, and a discussion of differences between the included papers. Data from different sources were not combined. The impact of differences between the primary studies was assessed in a sensitivity analysis, although the authors did not report which variables were altered. This reduces the understanding for the reader and hinders the transferability of the results to other settings. However, the authors did state that further details of the sensitivity analysis were available elsewhere.

Validity of estimate of measure of benefit
The authors used a prior study, which assessed quality of life changes due to weight loss, to provide a parameter for their own analysis. More specifically, the number of QALYs gained for 100 people treated with orlistat for one year. This was appropriate for this study and makes it more broadly comparable to other treatments.

Validity of estimate of costs
The authors did not state the perspective for the cost analysis. Therefore, it was not possible to assess whether all the relevant costs were included. However, the perspective appears to have been that of the health care provider, as costs relevant to this were included. Given the wide range of cost-effectiveness ratios reported in the sensitivity analysis, small changes in cost due to omissions or different perspectives may well impact on the results achieved. The unit costs were reported separately. Further details of the analysis, such as information on the perspective adopted, would have improved the study.

Other issues
The authors reported that it was difficult to compare their results with other studies because of the lack of cost-effectiveness analyses in this area. Nevertheless, they could have compared the resultant cost-effectiveness ratios with other generally accepted technologies to determine whether orlistat was broadly cost-effective or not. The issue of the generalisability of the results to other settings was not explicitly addressed, although the sensitivity analysis does improve the ability to transfer the results. The results were not reported selectively and the effectiveness conclusions reflected the scope of the study. Limitations were apparent due to the short nature of the study. The study might have been improved further by comparing two technologies, or by comparing orlistat treatment over different time periods.

Implications of the study
The authors did not make any recommendations for policy or practice as a result of their study. However, they suggested that further work was required to clarify the longer-term effects of orlistat. Also, to understand the long-term impact of mortality and morbidity from short-term weight loss.

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Other publications of related interest
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