Cost-effectiveness of pharmacotherapy to reduce obesity
Veerman JL, Barendregt JJ, Forster M, Vos T

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 evaluated the cost-effectiveness of pharmaceutical interventions, versus standard care, for obesity in Australian adults aged 20 years or older. The authors found that the drugs were unlikely to be cost-effective, in Australia. The reporting was generally sufficient, but the assumption for weight regain was not explained and the authors' conclusions do not appear to account for the uncertainty in this assumption.

Type of economic evaluation
Cost-utility analysis

Study objective
This study evaluated the cost-effectiveness of pharmaceutical interventions, versus standard care, for obesity in Australian adults aged 20 years or older.

Interventions
Pharmaceutical care consisted of either 15mg sibutramine, once daily, or 120mg of orlistat, thrice daily. Patients were allowed one 12-month course of treatment. This was compared with usual care, with no drug treatment.

Location/setting
Australia/primary care.

Methods
Analytical approach:
The authors used a Markov model that allowed obesity and the absolute risk of obesity-related disease to vary by age. The nine obesity-related diseases were: stroke, ischaemic heart disease, hypertensive heart disease, diabetes mellitus, osteoarthritis, post-menopausal breast cancer, colon cancer, endometrial cancer, and kidney cancer. The time horizon was lifetime. The authors stated that they adopted a health sector perspective.

Effectiveness data:
The effectiveness of the interventions was measured by short-term weight loss, which lowered a patient's risk of disease. The estimates at one year were from a recently published meta-analysis. The change in disease risk was calculated using the Potential Impact Fraction, with relative risks from the World Health Organization (WHO) and a study on body mass index and the risk of developing diabetes. The effectiveness of usual care was based on the expected obesity-related disease trends in Australia. The drug effectiveness included the proportion of patients who did not take their medication. Weight regain data were from the Sibutramine Trial of Obesity Reduction and Maintenance (STORM) trial for sibutramine and were assumed to be the same for orlistat. It was assumed that none of the weight loss was permanent.

Monetary benefit and utility valuations:
Health-related quality of life utilities were calculated, for the nine disease states, using disability-adjusted life-year (DALY) weights from an Australian study.

Measure of benefit:
The DALYs averted were the summary measure of benefit and they were discounted at 3% annually.

Cost data:
The cost data for the nine diseases were from Australian government sources. The cost categories included the costs of medication, general practitioner visits, average annual health care, and patient time and travel. Patient time was valued at 25% of the average wage in Australia, and the results were presented both with and without travel and time costs. All costs were reported in 2003 Australian dollars (AUD), with adjustments made using Australian government indices. They were discounted at 3% annually.

Analysis of uncertainty:
One-way sensitivity analysis was conducted by adjusting the weight regain assumptions, including halving the rate of weight regain; halving the linear weight gain over three years, following the cessation of therapy; assuming 23% of weight gain was permanent; and adding a utility gain of 0.017 per unit reduction in body mass index, in a year. Uncertainty was quantified by calculating 95% confidence intervals around the model outputs, using Monte Carlo simulation.

Results
Neither drug averted more than 0.2% of the disease burden. The incremental cost-effectiveness ratio (ICER) for drug treatment over usual care ranged from AUD 93,000 per DALY averted with sibutramine excluding travel, time, and unrelated health care costs, to AUD 350,000 per DALY averted with orlistat including all costs.

In the sensitivity analyses, a 23% rate of permanent weight loss, and the inclusion of utility for weight loss, most influenced the results. When 23% of the weight loss was permanent, the ICER was AUD 18,000 per DALY averted with sibutramine, and AUD 29,000 per DALY averted with orlistat. Adding utility for weight loss made sibutramine cost-effective and nearly made orlistat cost-effective, at a threshold of AUD 50,000 per DALY averted.

Authors’ conclusions
The authors concluded that, at the expected rate of weight regain and cost of medication, drug intervention was unlikely to be cost-effective, in Australia. The effect of medication on the burden of obesity-related disease was likely to be negligible.

CRD commentary
Interventions:
The interventions were described. The model assumed that patients could only receive one year of sibutramine or orlistat in a lifetime, according to Australian rules, which might not be relevant for other settings.

Effectiveness/benefits:
The effectiveness data were based on a recent meta-analysis, which the authors referenced. The methods adopted in that meta-analysis were not reported in this paper. Subsequent to the paper, the authors have stated that they conducted a search of the literature for relevant studies using PubMed though the details are unknown. The weight regain data in Table one differed from those in the text. Subsequent to the paper the authors have stated that to their knowledge the STORM trial was the only study to investigate the durability of the effect of weight loss drugs on an RCT basis and there is no evidence for permanent weight loss. The disability weights were appropriately based on an Australian study, but the DALY results cannot be compared with those of studies using quality-adjusted life-years (QALYs). Health states were valued using DALYs. QALYs were used to value BMI loss in a sensitivity analysis. It’s not known how the QALY value would compare to a DALY value.

Costs:
The costs appear to have been appropriately derived and were from Australian sources. Patient time costs were included at a quarter of the average hourly wage rates, and no justification was provided for this assumption. The cost adjustments were appropriately based on Australian data.

Analysis and results:
The incremental results for the drugs, compared with standard care, were reported. The absolute results for all interventions would have been useful. The cost-effectiveness of sibutramine, compared with orlistat, was not reported, but this was not an objective of the study. The sensitivity analysis was broad, but some parts were not clearly reported. The maintenance of weight loss was varied in appropriate sensitivity analyses, but it would have been useful to know the percentage of permanent weight loss at which the drugs became cost-effective. Confidence intervals for the results were
reported. It was not clear if weight regain was varied in the probabilistic sensitivity analysis, as the data reported in the
text differed from those in the table. The rates of attrition and DALY weights do not seem to have been varied in the
probabilistic sensitivity analysis. Most of the distributions used in the probabilistic sensitivity analysis were appropriate,
but triangular distributions were used for all the time measurements, for the cost estimates, and these were not
sufficient.

Concluding remarks:
Although the reporting of some methods was limited, the authors’ conclusions appear appropriate.

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