Modeling the cost and outcomes of pharmacist-prescribed emergency contraception
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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 emergency contraceptive pills (ECP) obtained from a pharmacist was compared with not using emergency contraception from this source. The Yuzpe regimen of 100 microg ethinyl estradiol and 0.50 mg levonorgestrel or 1.0 mg norgestrel per dose, given in two doses, was modelled.

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The patient population was not described. It can be inferred to have been women who had had unprotected sex and who had identified themselves as being at risk of becoming pregnant.

Setting
The setting was the community. The pilot study on which this paper was based was conducted in Washington State, USA (see Other Publications of Related Interest).

Dates to which data relate
The effectiveness evidence was obtained from sources published between 1995 and 1999. The cost data were obtained from sources published between 1995 and 1999. The price year was 1998.

Source of effectiveness data
The effectiveness data were derived from a review and synthesis of published studies and statistics.

Modelling
A decision tree model was used to compare the outcomes for private and public payers of the decision to use or not use pharmacist-prescribed emergency contraception after unprotected sex. The time horizon for the model was 9 months.

Outcomes assessed in the review
The following outcomes, expressed as percentages, provided input parameters for the model:

- go to physician or clinic,
- nausea,
conception,
ECP risk ratio,
induced abortion,
spontaneous abortion,
ectopic pregnancy, and
birth.

Study designs and other criteria for inclusion in the review
Not reported. The author directed the reader to a website for a detailed description of the methods, but the URL for this site was no longer valid.

Sources searched to identify primary studies
Not reported.

Criteria used to ensure the validity of primary studies
Not reported.

Methods used to judge relevance and validity, and for extracting data
Not reported.

Number of primary studies included
The values for the parameters in the model were obtained from three published studies, statistics from a government website and the unpublished results of a survey.

Methods of combining primary studies
Not reported.

Investigation of differences between primary studies
Not reported.

Results of the review
The results for most parameters were expressed as point estimates with a range:
go to a physician or clinic, 45.30% (range: 11.30 - 79.30);
nausea, 50.50% (range: 37.90 - 63.13);
conception, 7.50% (range: 5.60 - 9.40);
ECP risk ratio, 0.25 (range: 0.18 - 0.34);
induced abortion, 46.56% (range: 34.92-58.20);
spontaneous abortion, 22.98% (range: 17.24 - 28.73);
ectopic pregnancy, 2.43% (range: 1.82 - 3.04); and
birth, 97.57%.

**Measure of benefits used in the economic analysis**
The authors did not develop a summary benefit measure for the economic analysis. Although the number of avoided pregnancies was the principal outcome produced with the model, this was not synthesised with the costs. The study can therefore be considered a cost-consequences analysis.

**Direct costs**
The risk parameters and the costs entered in the model were reported separately. Both patient and public payer perspectives were considered in the analysis. The costs included were nausea, ECP pharmacy costs, ECP physician costs and unintended pregnancy costs (i.e. induced abortion, spontaneous abortion, ectopic pregnancy and birth). The cost data were obtained from electronic and published sources from 1995 to 1999 and were adjusted to a 1998 price year. Discounting was, appropriately, not applied as the timeframe was only 9 months. The average costs were reported.

**Statistical analysis of costs**
Point estimates and a range of values were presented. No statistical analysis of the costs was reported.

**Indirect Costs**
The indirect costs were not included.

**Currency**
US dollars ($).

**Sensitivity analysis**
A sensitivity analysis was undertaken on all parameters and costs used in the model to investigate variability in the data. The ranges of values used were taken from published sources or, if unavailable, the point estimate was generally varied by 25%. Probabilistic and multivariate sensitivity analyses were undertaken using Monte Carlo simulation, assigning a normal distribution to the costs and a logistic-normal distribution for the risks.

**Estimated benefits used in the economic analysis**
The incidence of pregnancy was 1.8% for ECP provided by the pharmacy and 4.9% for ECP obtained from a physician. The absolute difference was 3.1% (95% confidence interval, CI: 1.1 - 5.3%). The other outcomes are reported in the "Results of the Review" section.

**Cost results**
From the perspective of a private payer, obtaining ECP from a pharmacy resulted in a $158 (95% CI: 76 - 269) reduction in the cost per woman having unprotected sex. From the perspective of a public payer, this reduction in cost was $48 (95% CI: 16 - 93) per woman.

**Synthesis of costs and benefits**
Not applicable.
Authors' conclusions
For a range of assumptions, obtaining emergency contraceptive pills (ECP) from a pharmacy reduced the number of unintended pregnancies and was cost-saving.

CRD COMMENTARY - Selection of comparators
The authors described a pilot trial that enabled women to obtain ECP from a pharmacist. It would appear that the comparator used (ECP from a physician) represented current practice in the authors' setting. Other comparators are available now that were not available at the time of the study (e.g. progestin-only ECP). You should decide if the study's comparator represents current practice in your own setting.

Validity of estimate of measure of effectiveness
The effectiveness data were derived from published sources. However, the authors did not state that a systematic review of the literature had been undertaken. For most of the parameters reported in the review only one source was referenced. Where more than one source was used, the authors did not report the method used to combine them. The authors did not consider the impact of differences between the primary sources when estimating the effectiveness. However, they did undertake sensitivity analyses on all of the parameters. This increases the validity of the effectiveness estimates used in the model.

Validity of estimate of measure of benefit
The authors did not derive a measure of health benefit. The analysis was, in effect, a cost-consequences study, although avoided pregnancies was the outcome of primary interest in the study.

Validity of estimate of costs
All the categories of cost relevant to the perspective were included in the analysis. The costs and the probabilities were reported separately. A sensitivity analysis of the model parameters was conducted, using ranges that appear to have been appropriate. A sensitivity analysis of the prices was also conducted. Discounting was unnecessary since the time horizon was 9 months. The price year was reported. A good feature of this study was that the costs to both the patient and public payer were considered. However, the indirect costs were not included and these are clearly relevant to a societal perspective.

Other issues
The authors made appropriate comparisons of their findings with those from other studies. However, the issue of generalisability to other settings was only partially addressed in that a range of values was explored in the sensitivity analysis. The authors do not appear to have presented their results selectively and their conclusions reflected the scope of the analysis.

The authors noted that lower effectiveness estimates from a recent study would decrease the cost-savings, although the use of progestin-only ECP would increase the cost-savings. The cost-savings may be reduced if a longer time horizon is used to allow for mistimed rather than unwanted pregnancies. The analysis is conservative because the efficacy of ECP diminishes over time.

Implications of the study
The limited window of effectiveness of ECP and the accessibility of pharmacies interact, so that obtaining ECP from a pharmacist after unprotected sex produces cost-savings when modelled under different assumptions. The authors noted the potential to reduce the burden and costs of unintended pregnancy.

Source of funding
Funded by the David and Lucile Packard Foundation.
Bibliographic details

PubMedID
11527778

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Ambulatory Care Facilities /economics /utilization; Clinical Protocols /standards; Contraceptives, Postcoital /economics; Cost Savings; Decision Support Techniques; Drug Costs /statistics & numerical data; Drug Prescriptions /economics; Female; Health Services Research; Humans; Models, Econometric; Monte Carlo Method; Outcome Assessment (Health Care); Pharmacies /economics /utilization; Physicians /economics /utilization; Pilot Projects; Pregnancy; Pregnancy, Unwanted /statistics & numerical data; Program Evaluation; Sensitivity and Specificity; Time Factors; Washington

AccessionNumber
22001008210

Date bibliographic record published
30/11/2004

Date abstract record published
30/11/2004