Clinical and financial analyses of ectopic pregnancy management at a large health plan

Hidlebaugh D, O’Mara P

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
Conservative (systemic methotrexate) versus surgical treatment (laparoscopy or laparotomy) for ectopic pregnancy.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Women with ectopic pregnancy insured by a health maintenance organization.

Setting
Hospital and outpatient clinic. The study was carried out in Massachusetts, USA.

Dates to which data relate
The effectiveness and resource use data relate to studies conducted between 1990 and 1995. The price date was not provided.

Source of effectiveness data
The estimates for reproductive outcome, surgical outcomes and morbidity and failure rates were derived from a single study.

Link between effectiveness and cost data
The costing was undertaken retrospectively on a subsample of that used in the effectiveness study.

Study sample
While no power calculations were reported, a total of 107 patients were included in the study. Of these, 13 patients received MTX treatment, 36 patients underwent laparotomy, and 58 patients were treated with laparoscopy. The mean ages were 30 (laparoscopy), 29 (laparotomy) and 30 (MTX).

Study design
Case series from a single centre. The duration of follow-up was at least 6 months: the mean duration was 51 months (laparotomy), 33 months (laparoscopy) and 14 months (MTX). The loss to follow-up was 11% for the laparotomy group, 12% for the laparoscopy group and zero for the MTX group.
Analysis of effectiveness
The analysis was based on treatment completers only. The primary health outcome was ‘reproductive outcome’ for those not referred for in vitro fertilization within 6 months after treatment for ectopic pregnancy. In addition, surgical outcomes and morbidity and failure rates were measured. The outcomes were assessed by means of telephone interview, letter, or chart review. The groups were comparable in terms of age.

Effectiveness results
The rate of those attempting pregnancy was 18 out of 36 (laparotomy), 31 out of 58 (laparoscopy), and 7 out of 13 (MTX). Of those attempting pregnancy, 66%, 77%, and 57%, respectively, achieved intrauterine pregnancy (p=0.422 for laparoscopy versus laparotomy). The rate of tubal pregnancy was 17%, 7%, and 0%, respectively (p=0.321 for laparoscopy versus laparotomy). Finally, the rate of ‘not pregnant’ cases was 17% (laparotomy), 16% (laparoscopy), and 43% (MTX). The rate of complications was 13.9%, 10.3%, and 7.7% (1/13), respectively (p=0.608 for the difference between surgical procedure results). The failure (persistent thromboplastic activity) rate was 2.7% (laparotomy), 3.4% (laparoscopy) and 0% (MTX).

Clinical conclusions
Laparoscopy and methotrexate are efficacious and safe in the treatment of ectopic pregnancy compared with laparotomy.

Measure of benefits used in the economic analysis
The outcome measure used was the number of pregnancies gained.

Direct costs
Some quantities of resource use were reported separately from the costs. Charges were used in the cost analysis, and included figures for operating costs associated with the hospital (both for the initial procedure and complications) and the outpatient clinic. The cost and resource use data were obtained over the period 1990-1995. Discounting was not applied due to the short period of follow-up. The price year was not clearly reported.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
The rate of those attempting pregnancy was 18 out of 36 (laparotomy), 31 out of 58 (laparoscopy), and 7 out of 13 (MTX). Of those attempting pregnancy, 66%, 77%, and 57%, respectively, achieved intrauterine pregnancy. The rate of tubal pregnancy was 17%, 7%, and 0%, respectively.

Cost results
The mean total charge (range) was $6,720 (4,907-11,852), $6,840 (3,737-13,659), and $818 (648-1,133), respectively, for the laparotomy (n=36), laparoscopy (n=58), and MTX (n=13) groups (p=0.77 for the comparison of the first two, and p<0.001 for the comparison of MTX and the surgical options).

Synthesis of costs and benefits
Costs and benefits were not combined as the efficacy outcomes were similar across the three groups. An incremental analysis was not performed.

**Authors' conclusions**  
MTX was found to be the most cost-effective option for the treatment of ectopic pregnancy. It was associated with a high post-treatment tubal patency rate and probably a high rate of intrauterine pregnancy, although the authors noted that results were preliminary and the treatment group was small. Laparoscopy and laparotomy had similar reproductive outcomes.

**CRD COMMENTARY - Selection of comparators**  
The authors compared MTX to laparotomy and laparoscopy for the treatment of ectopic pregnancy and justified these choices of comparators in terms of experience in their own institution. You, as a user of this database, should consider whether these are widely used health technologies in your setting.

**Validity of estimate of measure of benefit**  
The validity of the study results may be open to doubt on the grounds that, according to the authors, using published selection criteria for single dose MTX, 21 of 94 (22%) of the study's surgical patients could have qualified for the nonsurgical option of treatment. This is merely a confirmation of the problems arising from the retrospective study design used, which is likely to present critical selection biases. The small study size introduced some limitations concerning the analysis of the effectiveness data.

**Validity of estimate of costs**  
Although some quantities of resource use were reported separately from the costs, the costing methodology lacked some details, and the price date was not stated.

**Other issues**  
The conclusions may not be justified, given the uncertainties in the data arising from the small study size. The issue of generalisability was not commented on in the study. However, appropriate comparisons were made with other studies in terms of complications, reproductive outcomes, duration of follow-up and failure rates.

**Implications of the study**  
Further studies are needed in order to validate the cost-effectiveness of the conservative versus the surgical treatment options for ectopic pregnancy. In particular, future studies should be improved in terms of the adequacy of the sample used to investigate efficiency issues.

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