Is conservative surgery for tubal pregnancy preferable to salpingectomy? An economic analysis

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 conservative surgery, compared with salpingectomy, for the treatment of tubal pregnancy.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The population comprised consecutive women who underwent laparoscopic surgery for tubal pregnancy. Patients with heterotopic pregnancies were excluded.

Setting
The study setting was hospital. The economic study was carried out in the Netherlands.

Dates to which data relate
The effectiveness and resource use data were gathered from women treated between September 1992 and November 1995, and from studies published between 1994 and 1996. The cost data were taken from studies published between 1988 and 1994. The price year was not reported.

Source of effectiveness data
The effectiveness data were derived from a single study and a literature review.

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

Study sample
The sample consisted of 115 consecutive women treated laparoscopically for tubal pregnancy: 39 and 76 women underwent laparoscopic salpingectomy and conservative laparoscopic surgery, respectively. No power calculations were reported in the determination of the sample size.

Study design
This was a prospective and retrospective cohort study carried out in two centres. There were no patients lost to follow-
Analysis of effectiveness

The analysis of the clinical study was based on intention to treat. The primary health outcomes used were elimination of trophoblast and the occurrence of intra-uterine pregnancy. The mean serum human chorionic gonadotrophin (hCG) concentrations, and the number of adhesions and tubal ruptures, were significantly higher in women treated by salpingectomy. Other baseline comparisons were not statistically different.

Effectiveness results

Intervention for persistent trophoblast was necessary in one woman after salpingectomy and in 17 women after conservative surgery. Spontaneous intra-uterine pregnancy rates until three years after salpingectomy and conservative surgery were 39 and 47%, respectively. The intra-uterine pregnancy rate after salpingectomy with additional IVF treatment was 63%.

Clinical conclusions

With respect to subsequent intra-uterine pregnancy, conservative surgery is slightly more effective than salpingectomy.

Modelling

Conservative surgery and salpingectomy with IVF-ET were compared with salpingectomy alone using a long-term model and bootstrapping techniques.

Outcomes assessed in the review

The review assessed spontaneous intra-uterine pregnancy rate, relative risk, subsequent intra-uterine pregnancy rate, and repeat ectopic pregnancy rate.

Study designs and other criteria for inclusion in the review

Not stated.

Sources searched to identify primary studies

Not stated.

Criteria used to ensure the validity of primary studies

Not stated.

Methods used to judge relevance and validity, and for extracting data

Summary statistics from individual studies.

Number of primary studies included

At least four primary studies were included.

Methods of combining primary studies

Primary studies were combined narratively.
Investigation of differences between primary studies
Not stated.

Results of the review
The spontaneous intra-uterine pregnancy rate after salpingectomy was 39%.

Assuming a relative risk of 1.2 for conservative surgery compared with salpingectomy, the spontaneous intra-uterine pregnancy rate after conservative surgery was 47%.

Subsequent continuing intra-uterine pregnancy rates of IVF-ET for tubal infertility were 16% for the first cycle, 15% for the second cycle, and 14% for the third cycle.

The repeat ectopic pregnancy rate after salpingectomy was 10.4%.

With a relative risk of 1.4, the estimated repeat rate of ectopic pregnancy after conservative surgery was 14.6%.

Measure of benefits used in the economic analysis
The intra-uterine pregnancy rate was used as the measure of benefits.

Direct costs
The direct costs were discounted at a rate of 5%. The quantities and costs were reported separately. The direct costs included the costs of operating time, hospital stay, blood transfusions, hospital interventions, hospital visits after discharge, infertility investigations and treatment. The quantity/cost boundary adopted was that of the hospital. The quantities and costs were estimated from the data, based on figures obtained from published studies and the authors' institution. The price year was not reported.

Statistical analysis of costs
The 95% confidence intervals of the mean difference in costs between the two treatments were calculated using bootstrapping techniques.

Indirect Costs
The indirect costs were discounted at a rate of 5%. The quantities and costs were not reported separately. The indirect costs included costs resulting from productivity losses. The quantity/cost boundary adopted was that of society. The quantities and costs were estimated from the data, based on figures obtained from published studies and the authors' institution. The price year was not reported.

Currency
UK pounds sterling (>). The exchange rate was 1 = 2.52 Dfl.

Sensitivity analysis
Threshold sensitivity analyses were conducted on the spontaneous pregnancy rate, intervention for persistent trophoblast, the risk of repeat ectopic pregnancy after conservative surgery, the costs of IVF treatment, and the IVF success rate.

Estimated benefits used in the economic analysis
Spontaneous intra-uterine pregnancy rates until three years after salpingectomy and conservative surgery were 39% and 47%, respectively. The intra-uterine pregnancy rate after salpingectomy with additional IVF treatment was 63%.
Cost results
The short-term costs were 1,554 for salpingectomy, 1,787 for conservative surgery, and 1,554 for salpingectomy with subsequent IVF-ET.

The long-term costs were 1,697 for salpingectomy, 2,012 for conservative surgery, and 5,458 for salpingectomy with subsequent IVF-ET.

Synthesis of costs and benefits
In the short term, salpingectomy was as effective as conservative surgery, but less costly.

The incremental cost-effectiveness of conservative surgery, compared with salpingectomy, was 4,063 per subsequent continuing intra-uterine pregnancy.

The incremental cost-effectiveness of salpingectomy with additional IVF treatment for infertility, compared with salpingectomy, was 15,629 per subsequent continuing intra-uterine pregnancy.

The spontaneous intra-uterine pregnancy rate after conservative surgery should be at least 42.2% if this treatment is to be as cost-effective as salpingectomy with additional IVF treatment.

Authors' conclusions
Salpingectomy is the treatment of choice in women not desiring future pregnancy. Salpingectomy seems less effective than conservative surgery when future pregnancy is desired, but is less costly. Conservative surgery seems more cost-effective than salpingectomy with additional IVF-ET.

CRD COMMENTARY - Selection of comparators
A justification was given for the comparator used, namely that it was a traditional treatment alternative. You, as a user of the database, should decide if these health technologies are relevant to your setting.

Validity of estimate of measure of effectiveness
The principal analysis was based on a cohort study, which was appropriate for the study question, but which had some limitations in terms of potential biases and confounding variables. The study sample was representative of the study population. The patient groups were not shown to be comparable at analysis in terms of hCG concentration, adhesions and tubal ruptures, and this also may have had an impact on the validity of the results. The authors undertook a literature review to derive additional effectiveness estimates, which seemed appropriate, although they did not describe their methods. The validity of the results was, however, enhanced by sensitivity analyses to account for variability in the estimates.

Validity of estimate of measure of benefit
Estimation of benefits was obtained directly from the effectiveness analysis.

Validity of estimate of costs
The cost analysis showed several good features: all relevant direct cost categories were included; the validity of the cost results was enhanced by appropriate sensitivity analyses; and quantities and costs were reported separately, which improved the generalisability of the results. The price year, however, was not reported which would make reflation exercises in other settings problematic.

Other issues
The authors made appropriate comparisons of their findings with those from other studies, but did not address the issue of generalisability to other settings. The authors did not present their results selectively. The study examined women treated laparoscopically for tubal pregnancy, and this was reflected in the authors' conclusions. The authors noted that a more severe clinical picture of women undergoing salpingectomy in other clinical settings could give rise to bias. Moreover, in women with a history of tubal pregnancy, the IVF-ET success rate may be higher than that used in the study. The psychological costs of IVF-ET treatment were not considered.

**Implications of the study**
The authors suggested that salpingectomy is the treatment of choice in women not desiring future pregnancy. Salpingectomy seems less effective than conservative surgery when future pregnancy is desired, but is less costly. Conservative surgery seems more cost-effective than salpingectomy with additional IVF-ET. Well-designed randomised controlled trials comparing salpingectomy and conservative surgery are needed.

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