Cost-effectiveness of infertility treatments: a cohort study
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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
Infertility treatments: intrauterine inseminations (IUI), clomiphene citrate and IUI (CC-IUI), hMG and IUI (hMG-IUI), assisted reproductive techniques (ART), and neosalpingostomy by laparoscopy.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients treated for infertility.

Setting
Hospital. The economic study was carried out in Iowa City, Iowa, USA.

Dates to which data relate
The main effectiveness and resource use data were taken from charts and medical records in 1992. Resources were measured in 1992 values.

Source of effectiveness data
Effectiveness data were derived from a single study.

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

Study sample
Power calculations were not used to determine the sample size. The patients were treated with the following procedures: assisted reproductive techniques (ART) (which includes IVF-ET, GIFT and zygote intrafallopian transfer - ZIFT), IUIs, clomiphene citrate and IUI (CC-IUI), hMG-IUI, and repair of obstructed fallopian tubes by laparotomy. The number of couples were 136 for ART, 54 for IUIs, 91 for CC-IUI, 52 for hMG-IUI, 24 for tubal surgery, 71 for IVF-ET (tubal factor only), and 26 for donor oocytes ART. The mean maternal age was 34, 31.6, 31.9, 32, 29.7, 32.3, and 37.8, respectively.

Study design
This was a retrospective cohort study. The duration of the follow-up was at least 6 months. Three patients in the surgical group were lost to follow-up.

**Analysis of effectiveness**
The analysis of the clinical study was based on treatment completers only. The primary health outcomes used in the analysis were the pregnancy rate and multiple birth rate. The effects of a woman's age and the number of spermatozoa inseminated were investigated.

**Effectiveness results**
The delivery rates were estimated to be 5.8 for IUI, 6.3 for CC-IUI, 17.5 for hMG-IUI, 27.7 for ART, 22.2 for IVF-ET (tubal factor only), 12.5 for tubal surgery, and 32.3 for donor oocytes ART. The multiple birth rate were estimated to be 0, 8.3, 21, 30, 44, 0, and 18, respectively.

**Clinical conclusions**
IUI, CC-IUI and hMG-IUI were less effective procedures than ART when evaluated on a delivery rate per cycle basis.

**Measure of benefits used in the economic analysis**
Delivery rate.

**Direct costs**
Discounting was not undertaken due to the short period of follow-up. Quantities of resource use were not reported separately from costs. The cost items were not reported separately. All medical costs associated with the treatments were included in the analysis (including the charges due to immediate complications of the treatments such as surgical complications, ovarian hyperstimulation, ectopic pregnancies, and selective reduction procedures). The perspective adopted in the cost analysis was not explicitly specified. The cost analysis was based on the charge data obtained from the study institution. The price year was 1992. The cost analysis did not cover the charges due to diagnostic evaluations and costs of obstetric care.

**Indirect Costs**
Not included.

**Currency**
US dollars ($).

**Sensitivity analysis**
Not undertaken.

**Estimated benefits used in the economic analysis**
The delivery rates were estimated to be 5.8 for IUI, 6.3 for CC-IUI, 17.5 for hMG-IUI, 27.7 for ART, 22.2 for IVF-ET (tubal factor only), 12.5 for tubal surgery, and 32.3 for donor oocytes ART, respectively.

**Cost results**
Not reported.
Synthesis of costs and benefits
Cost per delivery was used as the measure of cost-effectiveness. The cost per delivery was estimated to be $8,674 (IUI), $7,808 (CC-IUI), $10,282 (hMG-IUI), $37,028 (ART), $43,138 (IVF-ET), $76,232 (tubal surgery), and $35,062 (donor oocytes ART). Increasing age in women, and lower numbers of spermatozoa inseminated, were estimated to be factors leading to higher costs per delivery for IUI, CC-IUI, hMG-IUI and ART.

Authors' conclusions
The study supports, in general, the use of IUI, CC-IUI and hMG-IUI before ART in women with open fallopian tubes. For women with blocked fallopian tubes, IVF-ET appears to be the best treatment from a cost-effectiveness standpoint.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparators is clear.

Validity of estimate of measure of benefit
Since performing a prospective, randomized trial was reported to be infeasible, the internal validity of the estimates of measure of benefit used in the economic analysis should be evaluated in the context of the retrospective design adopted for the study.

Validity of estimate of costs
Quantities were not reported separately from costs. However, adequate details of methods of quantity/cost estimation were given. Important cost items, such as costs associated with delivery and neonatal care of multiple gestations and indirect costs borne by the patients were omitted, as the authors themselves acknowledged. Charges were used rather than of true costs.

Other issues
In view of the retrospective study design, the lack of a comprehensive sensitivity analysis, and a comprehensive cost analysis with statistical analysis of the costs, the results need to be treated with some caution. The issue of generalisability to other settings or countries was not addressed, although appropriate comparisons were made with other studies in terms of cost-effectiveness, costs of infertility treatments and detrimental effects of aging on female fertility and of reduced sperm counts on the effectiveness of various procedures. The results were not presented selectively. With respect to the presence of elements such as patients= time, frustration, and grief, a cost-utility approach may have been more appropriate.

Implications of the study
Further prospective analysis is required. Moreover, costs associated with delivery and neonatal care of multiple gestations need to be included in the analysis.

Source of funding
None stated.

Bibliographic details

PubMedID
9130886
Original Paper URL
http://www.meddevel.com/site.mash?left=/library.exe& amp;m1=1& amp;m2=1& amp;right=/library.exe&action=home&site=FNS&jcode=FNS

Indexing Status
Subject indexing assigned by NLM

MeSH
Clomiphene /therapeutic use; Cohort Studies; Cost-Benefit Analysis; Embryo Transfer /economics; Fallopian Tube Diseases /complications /surgery; Female; Fertilization in Vitro /economics; Humans; Infertility /economics /therapy; Infertility, Female /etiology /therapy; Insemination, Artificial, Homologous /economics; Male; Menotropins /therapeutic use; Ovulation Induction /economics; Pregnancy; Reproductive Techniques /economics

AccessionNumber
21997000620

Date bibliographic record published
30/04/2000

Date abstract record published
30/04/2000