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TABLE OF CONTENTS

HEADER	1
ABSTRACT	1
PLAIN LANGUAGE SUMMARY	2
BACKGROUND	3
OBJECTIVES	3
METHODS	3
RESULTS	5
DISCUSSION	5
AUTHORS' CONCLUSIONS	5
ACKNOWLEDGEMENTS	5
REFERENCES	6
APPENDICES	6
WHAT'S NEW	8
HISTORY	8
CONTRIBUTIONS OF AUTHORS	8
DECLARATIONS OF INTEREST	9
SOURCES OF SUPPORT	9
NOTES	9
INDEX TERMS	9

[Intervention Review]

In vitro fertilisation versus tubal reanastomosis (sterilisation reversal) for subfertility after tubal sterilisation

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ABSTRACT

Background

Tubal sterilisation is the most popular contraceptive method in the world. Approximately 138 million women of reproductive age have had tubal sterilisation and there is evidence that increasingly younger women are being sterilized. With such large numbers of women choosing this option of birth control, it is clear that even if a small percentage of women later regret the decision, large numbers of women will seek counselling regarding reversal from their physicians.

Objectives

To compare the efficacy of surgical tubal reanastomosis and in vitro fertilisation in terms of live birth rates. The morbidity and cost-effectiveness of both techniques were also to be compared.

Search methods

In a recent update of this review the following databases were searched: Cochrane Menstrual Disorders and Subfertility Review Group Specialised Register, MEDLINE (1966 to 2009), EMBASE (1980 to 2009), PsychInfo (1806-2009) and CENTRAL (2nd quarter 2009). We handsearched the reference lists of trials, reviews and relevant textbooks; searched abstracts from relevant conferences, and personally communicated with experts in the field.

Selection criteria

Randomised trials comparing surgical reversal of tubal sterilisation with in vitro fertilisation (IVF).

Data collection and analysis

No RCTs were found that met the selection criteria.

Main results

No data exist on which to report.

Authors' conclusions

There is little likelihood that any future research will be conducted to compare IVF with tubal reanastomosis for subfertility after tubal sterilisation. Therefore this review will not be updated in the future.

PLAIN LANGUAGE SUMMARY

In vitro fertilisation versus tubal reanastomosis (sterilisation reversal) for subfertility after tubal sterilisation

Many women choose tubal sterilisation as a way of birth control. Even if a small percentage of women later regret the decision, large numbers of women will seek counselling regarding reversal from their physicians. The review authors searched the literature and were unable to find any trial that met the criteria for this review. There is little likelihood that any future research will be conducted to compare IVF with tubal reanastomosis for subfertility after tubal sterilisation. Therefore this review will not be updated in the future.

BACKGROUND

Description of the condition

Tubal sterilisation is the most popular contraceptive method in the world (Chi 1994). Approximately 138 million women of reproductive age have had tubal sterilisations and there is evidence that increasingly younger women are being sterilized. With such large numbers of women choosing this option of birth control, it is clear that even if a small percentage of women later regret the decision, large numbers of women will seek counselling regarding reversal from their physicians (Van Voorhis 2000).

The incidence of post sterilisation regret has been reported to range between 2.1 to 26% (Chi 1994). However, only a small proportion of women experiencing regret actually request a reversal of the procedure. The incidence of reversal has been reported to be between 1 to 13% of sterilized women, but in most studies it is only reported as being between 1 to 2% (Van Voorhis 2000).

Major risk factors for subsequent regret of sterilisation include young maternal age (that is, younger than 30 years of age) and marital status change after the sterilisation (Wilcox 1990). Other risk factors include death of a child, lower socioeconomic status, and lower educational attainment.

Description of the intervention

Surgical reversal of sterilisation has been carried out since 1970s with the procedure performed through laparotomy, mini-laparotomy, or laparoscopy.

Different studies reported tubal patency, total pregnancy, intrauterine pregnancy, or delivery rates. Studies were largely retrospective and reported on different participants' populations and different surgical techniques, and many included only small numbers of women.

The largest studies reported delivery rates of 45 to 82% after ligation reversal by laparotomy, and 25 to 73% after laparoscopic reversal, with ectopic pregnancy rates between 1 and 7% (Van Voorhis 2000). A successful outcome after surgical sterilisation reversal is influenced mainly by age of the woman and the preoperative length of the fallopian tubes (Rouzi 1995).

Results from IVF studies do not report separately on women with previous tubal sterilisation. However, the cumulative live birth rate in women who had undergone IVF for tubal disease was reported to be 55.8% (Witsenburg 2005).

How the intervention might work

Studies report success rates for reversal of tubal sterilisation ranging between 25 to 82% (Van Voorhis 2000). This wide variation is attributed to many factors and the definition of 'success' varies between studies.

Why it is important to do this review

The development of assisted reproduction techniques, mainly IVF-ET provides an alternative to the surgical approach. This review aimed to compare the surgical intervention with IVF.

OBJECTIVES

The objective of this review was to compare the efficacy, in terms of live birth rates, of surgical tubal reanastomosis and in vitro fertilisation. The morbidity and cost-effectiveness of both techniques was to be also compared.

METHODS

Criteria for considering studies for this review

Types of studies

Randomised controlled trials comparing surgical reversal of tubal sterilisation with in vitro fertilisation.

Types of participants

Women seeking restoration of fertility following tubal sterilisation.

Types of interventions

Surgical reversal of tubal sterilisation (by macro- or micro-surgery, laparotomy, minilaparotomy or laparoscopy) and in vitro fertilization.

Types of outcome measures

Primary outcomes

(1) Live birth rate

Secondary outcomes

(1) Ectopic pregnancy rate

(2) Other serious (life threatening) maternal morbidity

(3) Cost-effectiveness

Search methods for identification of studies

Electronic searches

The following databases were searched:

- 1) Cochrane Menstrual Disorders and Subfertility Review Group Specialised Register of Controlled Trials. See [Appendix 5](#)
- 2) MEDLINE (1966 to 2009), using the search strategy detailed in [Appendix 1](#)
- 3) EMBASE (1980 to 2009), see [Appendix 2](#)
- 4) Psycinfo (1806-2009), see [Appendix 3](#)
- 5) CENTRAL (2nd quarter 2009), see [Appendix 4](#)

Searching other resources

- 1) Handsearching the reference lists of trials, reviews and relevant textbooks
- 2) Abstracts from relevant conferences
- 3) Personal communication with experts in the field

Data collection and analysis

Selection of studies

Study selection would have been undertaken independently by two review authors after employing the search strategy outlined above. Both authors would have independently assessed whether the studies met the inclusion criteria; any discrepancies would have been resolved by a third review author. Further information would have been sought from the trial report authors where papers contain insufficient information to make a decision about eligibility.

Data extraction and management

The following data would have been extracted:

Trial characteristics:

1. method of randomisation;
2. duration and type of follow up;
3. number of women recruited, randomised, excluded, analysed, or lost to follow up;
4. location of trial, single-centre or multi-centred;
5. timing of trial;
6. whether a power calculation was done;
7. source of funding.

Characteristics of study participants:

1. age of woman, and other demographic information;
2. previous treatment.

Types of interventions:

1. method of surgical reversal of tubal sterilisation used;
2. duration of treatment, how many IVF cycles were offered;
3. complications affecting the technique used.

Data extraction would have been performed independently by two review authors. Discrepancies would have been resolved by discussion.

Assessment of risk of bias in included studies

Assessment of bias would have been performed according to the Cochrane Collaboration's tool for assessing risk of bias. Potential sources of bias that would have been assessed would have included the following domains:

- Sequence generation
- Allocation concealment
- Incomplete outcome data
- Selective reporting

- Other sources of bias: other factors that may affect the outcome in either group, e.g. the presence of other factors that would reduce fertility following the surgical procedure (other causes of infertility), or skill of the person performing the surgical procedure.

Measures of treatment effect

Only data from truly randomised studies were to be included in the analysis.

For binary data, results for each study were to be expressed as odds ratios with a 95% confidence interval and combined for meta-analysis with RevMan software using the Peto-modified Mantel-Haenszel method.

Continuous differences between groups in the meta-analysis will be shown as mean differences (MD) and 95% confidence intervals. A fixed approach will be used unless there is significant heterogeneity, in which case results will be confirmed using a random-effects statistical model.

Data from cost-effectiveness studies would have pooled if they represent comparable health economies, otherwise, they would have been presented individually.

Unit of analysis issues

The primary analysis was to be per woman randomised.

Dealing with missing data

The data was to be analysed on an intention-to-treat basis as far as possible and attempts would have been made to obtain missing data from the original investigators.

Assessment of heterogeneity

The review authors would have considered whether the clinical and methodological characteristics of the included studies were sufficiently similar for meta-analysis to provide a meaningful summary. Heterogeneity would have been evaluated through the I^2 statistic. If substantial heterogeneity had been detected, possible explanations will be explored in sensitivity analysis.

Assessment of reporting biases

In view of the difficulty in detecting and correcting for publication bias and other reporting biases the authors would have aimed to minimise their potential impact by ensuring a comprehensive search for eligible studies and by being alert for duplication of data. If there were ten or more studies in an analysis, a funnel plot would have been used to explore the possibility of small study effects.

Data synthesis

If data was available the review authors explore the defined outcomes for each intervention.

Subgroup analysis and investigation of heterogeneity

If sufficient data had been available, results would have been subgrouped according to the method of reversal of sterilisation.

Sensitivity analysis

Where heterogeneity was substantial sensitivity analysis might be conducted to attempt to explain the effect.

RESULTS

Description of studies

The review authors did not identify any trials that matched the inclusion criteria. In fact the review authors found no trials at all that compared surgical reversal of tubal sterilisation with IVF.

Risk of bias in included studies

The review authors did not identify any suitable trials for inclusion.

Effects of interventions

In the absence of any suitable controlled trials in this area no data exist on which to report.

DISCUSSION

There are currently no randomised controlled studies comparing the efficacy of either surgical reversal or IVF in restoring fertility following tubal sterilisation. Given the enthusiasm of many of the clinicians towards one procedure or the other, and the possible

success or cost implications, there is a need for well-designed trials randomised controlled trials in this area.

AUTHORS' CONCLUSIONS

Implications for practice

No information is available which can influence current practice.

Implications for research

It is unlikely that in the future there will be a well-designed controlled clinical trial to compare the efficacy and safety of surgical reversal of tubal sterilisation and IVF in restoring fertility in women seeking pregnancy following tubal sterilisation. This review will therefore not be updated in the future.

ACKNOWLEDGEMENTS

The authors acknowledge the support of the MDSG

The authors acknowledge the contribution of Dr Julie Brown in the 2009 update of this review and formatting of the review to Revman 5.

REFERENCES

Additional references

Chi 1994

Chi IC, Jones DB. Incidence, risk factors, and prevention of poststerilization regret in women: an updated international review from an epidemiological perspective. *Obstetric and Gynaecology Survey* 1994;**49**(10):722-32.

Rouzi 1995

Rouzi AA, Mackinnon M, McComb PF. Predictors of success of reversal of sterilization. *Fertility and Sterility* 1995;**64**(1):29-36.

Van Voorhis 2000

Van Voorhis BJ. Comparison of tubal ligation reversal procedures. *Clinical Obstetrics and Gynecology* 2000;**43**(3):641-9.

Wilcox 1990

Wilcox LS, Chu SY, Peterson HB. Characteristics of women who considered or obtained tubal reanastomosis: Results from a prospective study of tubal sterilization. *Obstetrics and Gynecology* 1990;**75**:661-5.

Witsenburg 2005

Witsenburg C, Dieben S, Van der Westerlaken L, et al. Cumulative live birth rates in cohorts of patients treated with in vitro fertilization or intracytoplasmic sperm injection.. *Fertility and Sterility* 2005;**84**(1):99-107.

APPENDICES

Appendix 1. Medline search strategy

- 1 exp embryo transfer/ or exp fertilization in vitro/ or exp sperm injections, intracytoplasmic/ (25736)
- 2 embryo transfer\$.tw. (5932)
- 3 in vitro fertili?ation.tw. (12756)
- 4 ivf-et.tw. (1464)
- 5 (ivf or et).tw. (121868)
- 6 icsi.tw. (3547)
- 7 intracytoplasmic sperm injection\$.tw. (3347)
- 8 (blastocyst adj2 transfer\$.tw. (308)
- 9 or/1-8 (141296)
- 10 exp Sterilization Reversal/ (1273)
- 11 (revers\$ adj3 tub\$.tw. (733)
- 12 (revers\$ adj3 ligation).tw. (145)
- 13 (tub\$ adj3 sterili\$.tw. (1870)
- 14 (Sterili\$ adj3 Revers\$.tw. (434)
- 15 reanastomos\$.tw. (1151)
- 16 or/10-15 (4791)
- 17 9 and 16 (202)
- 18 randomized controlled trial.pt. (270500)
- 19 controlled clinical trial.pt. (79176)
- 20 randomized.ab. (180480)
- 21 placebo.tw. (115211)
- 22 clinical trials as topic.sh. (143058)
- 23 randomly.ab. (130974)
- 24 trial.ti. (78769)
- 25 (crossover or cross-over or cross over).tw. (42715)
- 26 or/18-25 (640944)
- 27 (animals not (humans and animals)).sh. (3278689)
- 28 26 not 27 (593527)
- 29 28 and 17 (7)
- 30 from 29 keep 1-7 (7)

Appendix 2. Embase search strategy

- 1 exp embryo transfer/ or exp fertilization in vitro/ or exp intracytoplasmic sperm injection/ (26010)
- 2 embryo\$ transfer\$.tw. (5610)
- 3 in vitro fertili?ation.tw. (11492)
- 4 ivf-et.tw. (1450)
- 5 icsi.tw. (3763)
- 6 intracytoplasmic sperm injection\$.tw. (3283)
- 7 (blastocyst adj2 transfer\$.tw. (307)
- 8 (ivf or et).tw. (153804)

9 or/1-8 (171113)
 10 exp female sterilization reversal/ (62)
 11 (revers\$ adj3 tub\$).tw. (566)
 12 (revers\$ adj3 ligation).tw. (122)
 13 (tub\$ adj3 sterili\$).tw. (1042)
 14 (Sterili\$ adj3 Revers\$).tw. (243)
 15 reanastomos\$.tw. (878)
 16 or/10-15 (2649)
 17 16 and 9 (142)
 18 Clinical Trial/ (540323)
 19 Randomized Controlled Trial/ (168697)
 20 exp randomization/ (26780)
 21 Single Blind Procedure/ (8152)
 22 Double Blind Procedure/ (72374)
 23 Crossover Procedure/ (21275)
 24 Placebo/ (126465)
 25 Randomi?ed controlled trial\$.tw. (33286)
 26 Rct.tw. (2746)
 27 random allocation.tw. (639)
 28 randomly allocated.tw. (10253)
 29 allocated randomly.tw. (1354)
 30 (allocated adj2 random).tw. (561)
 31 Single blind\$.tw. (7506)
 32 Double blind\$.tw. (85183)
 33 ((treble or triple) adj blind\$).tw. (140)
 34 placebo\$.tw. (110680)
 35 prospective study/ (81997)
 36 or/18-35 (709926)
 37 case study/ (6055)
 38 case report.tw. (119990)
 39 abstract report/ or letter/ (498346)
 40 or/37-39 (622054)
 41 36 not 40 (685188)
 42 16 and 9 and 41 (4)
 43 from 42 keep 1-4 (4)

Appendix 3. Psychinfo search strategy

1 exp embryo transfer/ or exp fertilization in vitro/ or exp sperm injections, intracytoplasmic/ (0)
 2 embryo transfer\$.tw. (66)
 3 in vitro fertili?ation.tw. (347)
 4 ivf-et.tw. (11)
 5 icsi.tw. (22)
 6 intracytoplasmic sperm injection\$.tw. (15)
 7 (blastocyst adj2 transfer\$).tw. (2)
 8 or/1-7 (390)
 9 exp Sterilization Reversal/ (0)
 10 (revers\$ adj3 tub\$).tw. (12)
 11 (revers\$ adj3 ligation).tw. (8)
 12 (tub\$ adj3 sterili\$).tw. (30)
 13 (Sterili\$ adj3 Revers\$).tw. (12)
 14 reanastomos\$.tw. (2)
 15 or/9-14 (57)
 16 8 and 15 (3)

Appendix 4. CENTRAL search strategy

1 exp embryo transfer/ or exp fertilization in vitro/ or exp sperm injections, intracytoplasmic/ (1315)
 2 embryo transfer\$.tw. (759)
 3 in vitro fertili?ation.tw. (1166)
 4 ivf-et.tw. (222)
 5 (ivf or et).tw. (5087)
 6 icsi.tw. (547)

7 intracytoplasmic sperm injection\$.tw. (327)
 8 (blastocyst adj2 transfer\$.tw. (57)
 9 or/1-8 (6143)
 10 exp Sterilization Reversal/ (9)
 11 (revers\$ adj3 tub\$.tw. (25)
 12 (revers\$ adj3 ligation).tw. (8)
 13 (tub\$ adj3 sterili\$.tw. (86)
 14 (Sterili\$ adj3 Revers\$.tw. (5)
 15 reanastomos\$.tw. (11)
 16 or/10-15 (128)
 17 9 and 16 (5)
 18 from 17 keep 1-5 (5)

Appendix 5. MDSG search strategy

Keywords CONTAINS "ivf" or "icsi" or "Embryo" or "in-vitro fertilisation " or "in vitro fertilization" or "intracytoplasmic sperm injection" or "Sperm Injections, Intracytoplasmic" or "ART" or "assisted reproduction techniques" or Title CONTAINS "ivf" or "icsi" or "Embryo" or "in-vitro fertilisation " or "in vitro fertilization" or "intracytoplasmic sperm injection" or "Sperm Injections, Intracytoplasmic" or "ART" or "assisted reproduction techniques"

AND

Keywords CONTAINS "tubal reconstruction" or "tubal anastomosis" or "reversal of sterilisation" or Title CONTAINS "tubal reconstruction" or "tubal anastomosis" or "reversal of sterilisation"

WHAT'S NEW

Date	Event	Description
19 May 2009	New search has been performed	A new search was conducted. No studies were identified that met the inclusion criteria
19 May 2009	Review declared as stable	There were no studies identified and this review is therefore no longer going to be updated

HISTORY

Protocol first published: Issue 2, 2003
 Review first published: Issue 3, 2006

Date	Event	Description
12 November 2008	Amended	Converted to new review format.
5 March 2006	New citation required and conclusions have changed	Substantive amendment

CONTRIBUTIONS OF AUTHORS

1.MY: registered the review title, reviewed the literature, wrote the review in collaboration with the co-reviewers.
 2.ADA: reviewed the protocol, designed the search strategy.

3.WG: reviewed the protocol, made proposals on data presentation.

4.AM: reviewed the protocol and modified the search strategy.

DECLARATIONS OF INTEREST

Nil

SOURCES OF SUPPORT

Internal sources

- None specified by authors, Not specified.

External sources

- None specified by authors, Not specified.

NOTES

This review was updated in May 2009, no studies were identified during this update. The review is therefore closed and no further searches will be conducted

INDEX TERMS

Medical Subject Headings (MeSH)

*Fertilization in Vitro; *Sterilization Reversal; Infertility, Female [*therapy]; Sterilization, Tubal [*adverse effects]

MeSH check words

Female; Humans