Comparison of intrauterine and intracervical insemination with frozen donor sperm: a meta-analysis

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Authors' objectives
To determine whether artificial insemination with frozen donor sperm yielded a higher pregnancy rate per cycle by intracervical (ICI) or intrauterine (IUI) techniques.

Searching
The authors searched the MEDLINE electronic database (1966 to time of writing) using the search terms: 'insemination', 'artificial', and 'heterologous'. The authors also searched the bibliographies of retrieved articles and abstract books from 1990 onwards from the annual meetings of the American Society for Reproductive Medicine, the Pacific Coast Fertility Society, the American College of Obstetricians and Gynecologists, the Society for Gynecologic Investigation, and the European Society for Human Reproduction and Embryology.

Study selection
Study designs of evaluations included in the review
Crossover or parallel group studies that compared IUI with ICI. All studies were prospective and six of the seven included studies were randomised for assignment to first cycle.

Specific interventions included in the review
Artificial insemination with frozen donor sperm using ICI or IUI techniques.

Participants included in the review
Women undergoing artificial insemination treatment.

Outcomes assessed in the review
Monthly fecundity (pregnancy) rates (MFR) per cycle. Pregnancy was defined as a positive serum human chorionic gonadotrophin (hCG) and visualisation of a gestational sac on ultrasonography.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
The authors used a six-criteria quality checklist (0-135 points) which covered study sample size, randomisation, timing of insemination, indication, female evaluation, and ovulation drugs. Quality scores (which ranged from 70 to 94) were included in the weighting of individual effect sizes. The authors do not state how the papers were assessed for quality, or how many of the reviewers performed the quality assessment.

Data extraction
The authors do not state how the data were extracted for the review, or how many of the reviewers performed the data extraction.

Data were extracted for the categories of: study identification, number of patients, number of cycles, design of study, total motile count (TMC), drugs, MFR, and P value.

Raw data were obtained for three studies and individual odds ratios were calculated for those studies using the generalised estimating method (GEE).
Methods of synthesis

How were the studies combined?
Pooled odds ratios (ORs) with 95% confidence intervals (CIs) were calculated from summary data using a random-effects model. Results were presented as a forest plot. The meta-analysis was also performed with the application of quality scores.

How were differences between studies investigated?
The chi-squared statistic was used to test for heterogeneity.

Results of the review

Seven studies were included in the review with 444 participants (699 cycles of ICI treatment and 688 cycles of IUI treatment).

The pooled OR was 2.4 (95% CI: 1.5, 3.8; heterogeneity P = 0.31) in favour of treatment with IUI techniques. The addition of quality scores had little impact on the results (OR value not stated) and a random-effects analysis using only the data as presented (i.e. no raw data) also did not affect the results (RR 2.2, 95% CI: 1.5, 3.3).

Authors' conclusions

The authors state that the evidence for superiority of IUI over ICI was consistent and convincing. Intrauterine insemination should be the preferred technique for artificial insemination with frozen donor sperm.

CRD commentary

The authors have stated their research question and some inclusion and exclusion criteria. The literature search was limited to one database although the authors did check the bibliographies of retrieved articles. The search was also limited to English language publications, so it is possible that relevant studies may have been missed. The authors did check abstract books from two annual meetings of relevant societies to attempt to identify other studies, including ones which were not published as full papers. The authors do not report whom, or how many of the authors, performed the selection of studies or the data extraction. There is a quality assessment of the included studies and these results were used in weighting the ORs pooled in the review. The statistical pooling appears to be appropriate with tests for heterogeneity being statistically non-significant. Details of the individual studies are adequately presented. The authors also discuss some of the possible bias which may have influenced the results however, the suitability of crossover studies for this indication and how they might influence the findings of the review was not discussed.

The authors' conclusions appear to follow from the results but these should be viewed with caution because of the methodological limitations in the process of the review.

Implications of the review for practice and research

Practice: The authors state that intrauterine insemination should be the preferred technique for artificial insemination with frozen donor sperm.

Research: The authors did not state any implications for further research.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.