Effects of general and locoregional anesthesia on reproductive outcome for in vitro fertilization: a meta-analysis

Authors' objectives
To evaluate prospective trials of general or locoregional anaesthesia on the reproductive outcomes of cleavage and pregnancy rate, for in vitro fertilisation (IVF).

Searching
MEDLINE was searched from 1966 to February 1999 using the following MeSH terms as keywords and textwords: 'anesthesia' and 'fertilization' or 'assisted reproductive technique', 'in vitro fertilization'. The authors also searched the reference lists of all primary studies in trial reports and review articles, and textbooks of anaesthesia, for other relevant studies. The search was limited to English language publications.

Study selection
Study designs of evaluations included in the review
Prospective, clinical investigations were sought.

Specific interventions included in the review
General anaesthesia compared with locoregional anaesthesia. Local and regional anaesthesia were included in the same category as locoregional anaesthetic technique. The main agents in the general anaesthesia group were not defined clearly in every study. Locoregional techniques were described as: 10 to 15 mL of 0.5% bupivacaine with 1.5 mg/kg pethidine and 10 mg diazepam (intravenous mix and drip in 100 mL isotonic saline solution); 5 mL (subcutaneous) 1% lidocaine with 50 to 100 mg pethidine and 25 mg promethazine (intravenous mix and drip in 100 mL 0.9% saline); epidural block, i.e. 12 mL 0.33% bupivacaine; or paracervical block, i.e. 400 mg mepivacaine.

Participants included in the review
Women undergoing IVF.

Outcomes assessed in the review
The reproductive outcomes of cleavage and pregnancy rate were assessed. Cleavage rate was defined as the percentage of oocytes successfully inseminated containing two or more cells. Clinical pregnancy was defined as the presence of one or more gestational sacs at ultrasound examination, performed approximately 5 to 6 weeks after transfer.

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
No formal assessment of quality was undertaken.

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; numbers of patients in groups of general and locoregional anaesthesia; study drugs, their routes of administration, and dosages; surgery type; methods of allocation of patients to each group; and reproductive outcomes.

The odds ratio (OR) and relative risk (RR) were calculated, along with 95% confidence intervals (CIs), for each individual trial.
Methods of synthesis
How were the studies combined?
Pooled ORs with 95% CIs were calculated using a fixed-effect model.

How were differences between studies investigated?
Chi-squared, according to the Cochran Q-test, was used to assess heterogeneity.

A L'Abbe's graph was used to further evaluate homogeneity and to compare effects.

Results of the review
Four prospective studies, which reported events but not the number of participants, were included in the review. Three studies were randomised and one study was a matched controlled trial.

L'Abbe's graph for heterogeneity was negative in both event rates of reproductive outcomes. Consistent effects were also demonstrated. Heterogeneity between the two groups was not statistically significant.

Pregnancy.
The pooled RR was 1.01 (95% CI: 0.95, 1.09, p=1.00) and the risk reduction was -1%. The pregnancy event rates that were consistently below the line of equality implied that the magnitude of effect was reliable. This corresponded to a RR of 0.75 (95% CI: 0.52, 1.06, p=0.99) for pregnancy and a risk reduction of 25% (95% CI: -6, +48).

The pooled ORs were 1.03 (95% CI: 0.90, 1.18, p=1.00) and 0.70 (95% CI: 0.47, 1.08, p=0.93) for cleavage and pregnancy rates, respectively.

Authors' conclusions
The authors state that depending on the available published evidence, no anaesthetic technique can be definitively recommended as being more beneficial on reproductive outcomes, i.e. cleavage and pregnancy rates, for IVF procedures requiring analgesia and anaesthesia.

CRD commentary
The authors have stated the research question, but the scope of the inclusion and exclusion criteria was limited. The literature search used only one database, was restricted to English language publications, and made no attempt to find unpublished or grey literature. It is possible that additional relevant studies may have been missed. There were no tests for publication bias.

The quality of the included studies was not formally assessed, and the authors have not reported how the articles were selected or who performed the selection and data extraction.

The data extraction is reported in a table and briefly discussed in the text of the review. Participants' characteristics and numbers of participants are missing from these details. The studies were statistically combined since no heterogeneity was found. Heterogeneity results were analysed further using L'Abbe plots.

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

Implications of the review for practice and research
The authors did not state any implications for further research and practice.

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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.