Cumulative Live Birth Rates after In Vitro Fertilization

Akademisk avhandling

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av

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Avhandlingen baseras på följande delarbeten:

I. Olivius C, Fridén B, Lundin K and Bergh C.
Cumulative probability of live birth after three in vitro fertilization/ intracytoplasmic sperm injection cycles.
Fertility and Sterility 2002;77;505-510.

II. Olivius C, Fridén B, Borg G and Bergh C.
Why do couples discontinue in vitro fertilization treatment? A cohort study.
Fertility and Sterility 2004:81;258-261.

Comment:
Olivius C, Fridén B, Borg G and Bergh C.
Psychological aspects of discontinuation of in vitro fertilization treatment.
Fertility and Sterility 2004:81;276.

III. Olivius C, Lundin K and Bergh C.
Predictive factors for live birth in cryopreservation single embryo transfer cycles.
Reproductive Biomedicine Online 2008;17:676-683.

IV. Thurin-Kjellberg A, Olivius C and Bergh C.
Cumulative Live-Birth Rates after Single-Embryo versus Double-Embryo Transfer.
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Cumulative Live Birth Rates after In Vitro Fertilization

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Background: In vitro fertilization (IVF) has become increasingly common, today representing about 3% of all live births in some countries. Most patients have to undergo more than one treatment in order to achieve a live birth. Thus cumulative live birth rates are highly interesting to the patients. The most important health problem in IVF is the high rate of multiple births, leading to increased risks for preterm birth and perinatal morbidity. Therefore, single embryo transfer (SET) has become more frequently used.

Aims: The aims of this thesis were to assess cumulative live birth rates after IVF and to investigate factors affecting the live birth rates.

Methods: *Paper I:* Cumulative live birth rates after a treatment programme consisting of three fresh IVF cycles and subsequent frozen-thawed cycles were investigated in 974 patients. Life table analysis with and without taking dropouts into account gave three estimates; "pessimistic", "realistic" and "optimistic". *Paper II:* Many of the patients in Paper I discontinued the treatment. The reasons for this were investigated in Paper II, by scrutinizing medical records and using questionnaires. *Paper III:* Maternal and embryonic factors were analyzed in 371 patients for possible prediction of live birth in frozen-thawed SET, using multiple logistic regression. *Paper IV:* A follow up of a previous randomized controlled trial (RCT), comparing single and double embryo transfer (DET) in 661 patients. Data on all additional frozen-thawed cycles were collected in order to present cumulative live birth rates.

Results: *Paper I:* The cumulative live birth rate after three fresh IVF cycles, mostly DETs, including subsequent frozen-thawed cycles was 63% with a “realistic” approach. *Paper II:* Of the couples in Paper I who did not achieve a live birth, 54% discontinued the treatment programme. The most important reasons were psychological stress and poor prognosis. The most frequent comment was “needed more information about the treatment”. *Paper III:* Positive predictors for live birth in frozen-thawed SET were blastomere survival rate, number of previous fresh cycles and conventional IVF as compared with intracytoplasmic sperm injection (ICSI). Number of embryos needing to be thawed in order to perform one transfer was negatively associated with pregnancy. *Paper IV:* The cumulative live birth rates after one fresh SET or DET and subsequent frozen-thawed cycles, with one or two embryos transferred according to the patient’s wish, were 44% in the SET group and 51% in the DET group ($p=0.08$). The multiple birth rates were 2% in the SET group and 28% in the DET group ($p<0.001$).

Conclusions: There is a good chance of achieving a live birth through a treatment programme of three IVF cycles. Implementation of SET is an effective way to decrease multiple birth rates. The cumulative live birth rate after one SET, including frozen-thawed transfers, was not significantly lower than after DET. The frozen-thawed cycles contribute significantly to the cumulative live births, and the knowledge of predictive factors for live birth in frozen-thawed cycles is valuable when deciding whether to perform SET or DET. The dropout rate from the treatment programme was high. The knowledge that many patients perceive IVF treatment as psychologically stressful and feel a need of more information can be useful in patient consultations and when organizing the care at the IVF clinics.

Key words:
In vitro fertilization, cumulative live birth, single embryo transfer, frozen-thawed cycle, discontinuation
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