

Pregnancy rates following the exclusive transfer of twice frozen twice thawed embryos using a modified slow cool cryopreservation technique

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Summary

Purpose: To determine the pregnancy rate following the exclusive transfer of twice frozen twice thawed embryos. **Materials and Methods:** All day 3 transfers of exclusive twice frozen-twice thawed embryos were retrospectively identified over a 13-year time-period. The cryopreservation technique used a simplified slow cool freezing protocol. Embryos could have been originally cryopreserved at the 2 pronuclear or multi-cell stage. **Results:** Survival rates were 83.3%. The live delivered pregnancy rate was 18.1% (15/83). The implantation rate was 13.1% (22/168). **Conclusions:** These data suggest that twice frozen twice thawed embryos should not be discarded but either transferred alone if they are the only embryos left, or mixed with frozen embryos that have never been thawed. Though the live delivered pregnancy rates are inferior to fresh embryo transfer the marked reduction in cost and avoidance of the risk of ovarian hyperstimulation justifies their transfer.

Key words: Twice frozen; Twice thawed; Slow cool; Frozen embryo transfer.

Introduction

To maximize the success of a given in vitro fertilization program it is essential to have a good cryopreservation program [1]. First time frozen embryos are generated in various ways: 1) purposely freezing all embryos because of risk of ovarian hyperstimulation, 2) purposely freezing all embryos because of inadequate endometrial thickness, 3) purposely freezing because of the consideration that previous failures to conceive despite IVF-ET were related to adverse effects of controlled ovarian hyperstimulation, 4) the presence of extra embryos that were not transferred on the fresh embryo transfer cycle.

When a group of cryopreserved embryos are thawed the best ones are selected for transfer based on embryo morphology (e.g., blastomere number, fragmentation, and symmetry). The main objective of this study was to determine if a group of cryopreserved embryos are thawed and the best ones are selected for transfer is it worth re-freezing the remainder not transferred for future use or should they be discarded. Thus this study was aimed to ascertain the pregnancy rate following the exclusive transfer of twice-frozen, twice-thawed de-selected embryos.

Materials and Methods

All first day 3 embryo transfers over a 13-year-period exclusively using twice frozen and twice thawed embryos were identified. The embryos were cryopreserved using a simplified slow cool freezing protocol which used an alcohol bath controlled rate freezer. The cryoprotectant, 1,2 propanediol, was removed

in one step [2]. A mixture of embryos originally frozen at the 2 pronuclear (PN) and multi-cell stage were allowed.

Results

There were 83 transfers of twice frozen twice thawed embryos. The woman's average age at cryopreservation was 32.9.

The clinical (ultrasound at 8 weeks), viable (live fetus at 12 weeks) and live delivered pregnancy rates were 20.5%, 19.3%, and 18.1%, respectively. The implantation rate was 13.1% (22/168).

The initial survival rate of the group of embryos eventually forming the twice frozen twice thawed group was 96.2% for 2PN embryos and 83.7% for multi-cell embryos. The survival rate at the time of the second thaw was 83.2%.

Discussion

The first reported case of a pregnancy following the exclusive transfer of twice frozen twice thawed embryos using a slow cool technique was published in 1996 [3]. This is the largest series of twice frozen twice thawed de-selected embryos to be evaluated.

Though the pregnancy rates may be only half as good as expected with fresh embryo transfers, the considerable financial savings and avoidance of the risk of ovarian hyperstimulation syndrome with another IVF-ET cycle makes the transfer of these embryos worthwhile.

There has been only one other publication of a smaller series of transfers of twice thawed twice frozen embryos (n = 36) but these embryos were cryopreserved using vitrification [4].

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