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P-206 Could day 7 embryo culture become standard practice to improve patients’ treatment and outcome?

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Study question: What are the clinical outcomes following transfer of day 7 embryos; could day 7 embryo culture become part of standard embryology practice?

Summary answer: Although clinical outcomes remain low, success has been seen following transfer of day 7 embryos. Extended culture plays an important role in standard embryology practice.

What is known already: In vitro culture conditions and cryopreservation techniques have improved greatly in recent years, allowing for extended culture, and freezing of embryos at the blastocyst stage. Optimal embryos should develop to the blastocyst stage on day 5, however deviation from normal development can sometimes occur due to problems in either the embryonic intrinsic factors or imprinting timings. Live births have been reported from slower developing day 7 embryos. Extended culture to day 6 is standard practice in most IVF laboratories, however the aim of this study is to investigate the outcomes following prolonged embryo culture to day 7.

Study design, size, duration: This is a retrospective analysis study of 47 patients who underwent frozen embryo transfers (FETs) with a cryopreserved day 7 embryo at a UK licensed centre between 2017-2021. Patients were split into two groups: those transferring untested (non-PGT-A) day 7 embryos, and those transferring euploid PGT-A tested day 7 embryos. Clinical pregnancy (CPR) was analysed to study the clinical outcome of day 7 embryo culture followed by a frozen transfer.

Participants/materials, setting, methods: All patients who had FET with a day 7 embryo between 2017-2021 were included in this study. A total of 49 FETs (48 eSET, 1 DET) involving 47 patients took place: 38 with untested embryos and 11 with euploid embryos. Clinical pregnancy rate (CPR) and live birth (LBR) was analysed to study the efficacy in transfer of day 7 embryos and the two groups of patients (untested and PGT-A tested) were compared.

Main results and the role of chance: The overall CPR per embryo transfer was 8% (47 patients, 49 ETs, 50 embryos transferred) and the LBR per embryo transfer was 4%. In the PGT-A group, a total of 201 day 7 embryos were biopsied over the 5-year study period; 28 were euploid following testing (14% euploidy rate). Of these, 11 have been transferred; 4 resulted in a pregnancy and 2 in a live birth. (LBR 18%) There is a significant difference in CPR between the PGT-A group (11 patients, 11 FETs; 11 embryos transferred, 4 foetal hearts seen, CPR=36%) and the untested group (36 patients, 38 ETs; 39 embryos transferred, CPR=0%) Chi square test performed and confirmed (p < 0.001). The mean age of the patient at the time of embryo transfer was 38.6 ± 0.5 and the mean age of the embryo transferred was 35.6±0.5 (this was the patient’s age at the time of embryo freezing).

Limitations, reasons for caution: Limiting factors include the retrospective study design and the small sample size. It is also worth noting the high number of day 7 embryos required to undergo PGT-A testing to result in a low number of euploid embryos suitable for embryo transfer.

Wider implications of the findings: This study indicates the value of day 7 embryo culture as it has resulted in some patients achieving an ongoing pregnancy and a live birth. However, care must be taken to counsel patients appropriately around the chance of success when transferring day 7 embryos, particularly patients using untested embryos.

Trial registration number: Not Applicable