Impact of maternal age on pregnancy outcome & embryo chromosomal status in ART cycles

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ABSTRACT

Objective: To evaluate the chromosomal status of embryos through preimplantation genetic testing (PGT-A) and assess pregnancy outcomes following frozen embryo transfer (FET) across different maternal age groups after IVF and PGT(A) at Ram Fertility & Women's Specialist Clinic and Genesis IVF and Women's Specialist Centre Penang, in the year 2024. **Materials and Methods:** A retrospective analysis was conducted on 3,381 embryos biopsied for PGT-A in 2024, stratified by maternal age groups: <30, 30-34, 35-39, and ≥40 years. Embryos were categorised as euploid, aneuploid, or mosaic. Additionally, pregnancy outcomes were analysed for 1,061 embryo transfers, assessing beta-positive rates, clinical pregnancy rates, and miscarriage rates. **Results:** The overall euploid rate was 43.1%, declining with maternal age (55.2% in <30 vs. 14.1% in ≥40). Aneuploidy increased with age, from 16.2% in <30 to 73.3% in ≥40. Mosaic rates were highest in the youngest group (28.6%) and lowest in the oldest (12.6%). From 1,061 FETs, the overall beta-positive rate was 73.4%, and the clinical pregnancy rate was 69.6%. Pregnancy rates remained consistently high across age groups: 67.9%–72.2%. The overall miscarriage rate was 7.9%, with the highest in women aged ≥40 (14.6%). **Conclusion:** Embryo chromosomal integrity is significantly influenced by maternal age, with increasing aneuploidy and decreasing euploid rates in older women. Despite this, consistently increased clinical pregnancy outcomes across age groups demonstrate the effectiveness of PGT-A and targeted embryo selection in optimising IVF success rates. These findings reinforce the importance of genetic screening and individualised treatment strategies to improve outcomes across all age groups.