P-550 Clinical outcomes of mosaic embryos are similar between young and older women.

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Study question: Are there differences in the clinical outcomes of mosaic embryos depending on the female age?

Summary answer: Clinical outcomes of mosaic embryo transfers are similar regardless female age.

What is known already: Chromosomal abnormalities are common in embryos analyzed in preimplantation genetic testing for aneuploidy (PGT-A) cycles. Mosaicism (the presence of two or more chromosomally distinct cell lines) is a usual event in embryos derived from IVF cycles.

Several studies show that mosaic embryos have reduced potential to reach term, compared to euploid embryos. The factors affecting the implantation potential and development of mosaic embryos are controversial. Recently, Victor et al. (2019) argued that mosaic blastocysts generated at younger ages show better outcomes compared to older ages. The aim of this study was to test this hypothesis in our centre.

Study design, size, duration: A total of 136 mosaic embryos from patients undergoing PGT-A cycles from May 2014 to October 2020 were retrospectively analyzed in this study. The blastocyst trophoectoderm biopsies of day 5 and 6 were analysed by aCGH (n=47, 30.1%) and NGS (n=109, 69.9%). An embryo was considered mosaic when the percentage of aneuploid cells were 25-50% in aCGH and 20-50% in NGS. Only single embryo transfer cycles were included in the analysis.

Participants/materials, setting, methods: Embryo analysis were performed using Agilent SurePrint G3 8x60K CGH microarrays or Veriseq NGS (Illumina), with previous whole genome amplification. We evaluated if clinical results of mosaic embryos transfers in IVF cycles were correlated with female age. The main outcome measures were β-hCG, implantation rate and ongoing pregnancy rate. β-hCG was measured in blood 14 days after the embryo transfer and was considered positive when it was >2 mUI/ml.The statistical analysis was performed with SPSSv20.0.

Main results and the role of chance: A total of 136 mosaic embryos were included in this study. Overall, we evaluated factors affecting embryo mosaicism implantation potential. Neither the percentage of mosaicism nor the segmental mosaicism were related to mosaic embryo implantation, pregnancy and ongoing pregnancy rates.

To evaluate the impact of female age in clinical outcomes, we established two different groups depending on whether mosaic blastocysts were generated from oocytes retrieved at young maternal ages (≤35 years; n=62) or at older ages (>35years; n=74).

No differences were found between groups. Nonetheless, to reduce bias, embryo quality, percentage of mosaicism, segmental mosaicism and whether the transferred embryo was frozen or fresh were included as confounding factors.

The rate of positive αhCG was similar between groups: 45.2% in ≤35y group vs 54.1% in >35y (p=0.476). The implantation rate was also similar: 30.6% vs 39.2% % (p=0.855), respectively. Furthermore, the ongoing pregnancy rate was higher in the >35y group (35.1%), compared to the ≤35y group (19.4%) without reaching statistically significant differences (p=0.245).

Limitations, reasons for caution: The sample size is a limitation. aCGH test and a different definition for mosaic embryo in terms of percentage of abnormal cells was employed in this study compared to Victor et. al. (2019) study. Larger prospective studies should evaluate the impact of maternal age in the outcome of mosaic embryos.

Wider implications of the findings: Our results challenge that female age is associated with clinical outcomes after the transfer of mosaic embryos. Comparable results were obtained in young and older women. Therefore, in the absence of euploid embryos, mosaic embryos might be considered for transfer and similar outcomes are expected regardless of the maternal age.

Trial registration number: Not applicable

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