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Title:

INTER-PROGRAM VARIATION IN DONOR OOCYTE ANEUPLOIDY RATE

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Background:

Ovum donation (OD) is effective in improving IVF outcomes in patients of advanced maternal age. Given the young age (21-31 years) of donors, aneuploidy rates are presumedly low. With the advent of high resolution chromosomal analysis technologies such as next-generation sequencing (NGS), there has been a recent trend towards screening embryos prior to transfer even in this lower-risk population.

Objective:

This study seeks to determine by pre-implantation genetic testing (PGT) with NGS the variation in rates of euploidy for OD patients among fertility centers.

Materials and Methods:

This retrospective, multi-center study included all OD cycles utilizing PGT with NGS from 2016-2017. Oocyte age, number of embryos obtained, day of embryo biopsy, ploidy status, and laboratory site were recorded. Trophectoderm biopsies were analyzed using a targeted next-

generation sequencing-based assay validated for whole chromosome and segmental (>10MB) aneuploidy detection. ANOVA, multivariate logistic regression and mixed generalized linear model analysis were applied.

Results:

Forty-nine fertility centers contributed 4,360 embryos from 666 donors for analysis by NGS. Average donor age was 26.1 ± 3.5 years. The average number of embryos biopsied by each clinic was 87.5 ± 119 (range: 2-432). Overall rate of euploid embryos per site was 67.5% (range: 18.2-100%, $p < 0.001$). After adjusting for potential confounders (donor age, number of embryos biopsied and day of biopsy), the likelihood of obtaining a euploid embryo was clinic-dependent. The calculated interclass correlation coefficient revealed that the fertility center performing the biopsy accounts for 2.2% of the variability in number of euploid embryos generated.

Conclusion:

Both genomic and non-genomic information are useful in selecting the best embryo for transfer from donor oocytes. This large, multicenter study shows less inter-program variability in aneuploidy rate than has been previously reported. Clinical trials relating to the role of stimulation protocols and laboratory techniques on embryo development and ploidy status may improve standardization and improve patient outcomes.

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