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## PGS can help women of advanced maternal age achieve pregnancy with their own eggs

Recently I treated a patient who typifies the clinical scenario and outcome of IVF/ICSI with 24-chromosome aneuploidy screening, or PGS. She is a 40 year old who was concerned about her risk of conceiving a chromosomally abnormal pregnancy due to her advanced maternal age. Concurrent indication for IVF/ICSI was male factor subfertility with a sperm density of 14.5 million/mL, a Kruger strict morphology of 3%, and on referral a history of failure to conceive with clomid combined with IUI.

### Did you know.....

- » PGS eliminates the effects of maternal age on implantation rates<sup>1</sup>
- » For maternal age  $\geq 40$  years, 89% of blastomeres and 68% of trophectoderm biopsies are aneuploid
- » When aneuploidy is detected, knowing maternal source of error can aid in solidifying the decision to pursue donor egg

With regard to maternal egg health as a function of age, emphasizing meiotic errors, we discussed that even embryos that develop normally to day 5 or 6 can harbor extra or missing chromosomes. These embryos cannot be identified by the way they look under the microscope and would otherwise be transferred to the womb with one of three outcomes:

1. failed IVF cycle where we would not know the reason (was it the fault of the embryo, uterus or transfer?)
2. a miscarriage
3. non-normal result on amniocentesis.

The couple opted for IVF/ICSI with 24-chromosome PGS. Ovarian stimulation protocol was excellent with 14 mature eggs retrieved, 100% fertilization with ICSI, and from the 14 early embryos produced, 8 were of sufficient quality on day 5/6 to perform laser trophoblast biopsy and freeze.

Of the 8 embryos biopsied, 2 were determined to be euploid (46,XX; 46,XY) with a confidence call of greater than or equal to 99% disomy across all 23 chromosome pairs. The cause of aneuploidy in 5 of the 6 abnormal embryos was found to be maternal in origin. The confidence call that is calculated on each chromosome and the parental source of aneuploidy are particularly powerful elements of the Gene Security Network testing platform.

In this case, both the percentage of abnormal embryos (80%), and the percentage of errors attributable to egg function (83%) is not an uncommon event when performing IVF/ICSI/PGS with a patient who is of advanced maternal age. For women who have the outcome of all embryos biopsied being aneuploid, source of error can aid in solidifying the decision to pursue donor egg after she has had a chance to pursue egg retrieval and embryo development with her eggs under the safety gate of screening the embryos for chromosomal errors prior to transfer and avoiding the aforementioned untoward outcomes.

For the above patient, her two euploid embryos were thawed and transferred. She was sent to her referring OB with a viable twin gestation at 9+ weeks. Evolving data from groups performing 24-chromosome PGS is that implantation rates and pregnancy rates in women of advanced maternal age are matching those of younger women provided they achieve a euploid transfer.

1. M. Rabinowitz, A. Beltsos, D. Potter, M. Bush, C. Givens, D. Smotrich Gene Security Network, Redwood City, CA; Huntington Reproductive Center, Laguna Hills, CA; Conceptions Reproductive Associates, Littleton, CO; Fertility Centers of Illinois, Chicago, IL; Pacific Fertility Center, San Francisco, CA; La Jolla IVF, La Jolla, CA, Effects of Advanced Maternal Age Are Abrogated in 122 Patients Undergoing Transfer of Embryos with Euploid Microarray Screening Results at Cleavage Stage, Abstract presented at American Society for Reproductive Medicine Annual Meeting 2010.