

IS THERE A RELATIONSHIP BETWEEN BLASTOCYST DEVELOPMENT AND ANEUPLOIDY RATE?

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Introduction: Controversy exists in the literature related to whether aneuploidy rates differ between embryos that blastulate earlier on Day 5 vs. later on Day 6 of culture. Increased aneuploidy rates were reported in day 6 embryos by some (Taylor et al, 2014; Piccolomini et al, 2016) but others found no difference (Jenner et al, 2016). It was also observed that embryos at an earlier stage of blastulation when biopsied were associated with increased aneuploidy (Kroener et al, 2012). Our objective was to test the hypotheses that delayed or absent blastulation are associated with increased aneuploidy

Material & Methods: This study had institutional REB approval. PGS was offered to patients with advanced maternal age (range 35-39 years). TE biopsy of day 5 (n=329) and day 6 (n=98) blastocysts was performed for whole chromosome aneuploidy screening using the 24Sure™ aCGH kit (BlueGnome) or VeriSeq™ PGS kit on the MiSeq system (Illumina). Before TE biopsy, blastocysts were morphologically graded as early blastocysts and expanding or expanded blastocysts. We utilized two-tailed chi-squared testing, with significance at *P*0.05.

Results: There was no difference in the aneuploidy rate between those embryos reaching blastocyst on day 5 (107/329; 32.5%) or day 6 (35/98, 35.7%) (*p*0.05), respectively. However, when the embryos were grouped into early vs more advanced expanding or expanded blastocysts, there was a significantly higher aneuploidy rate in early (40/85, 47.1%) vs. advanced (102/342, 29.8%) (*P*0.01) blastocysts, independent of the day of biopsy.

Conclusions: Delayed blastulation on day 6 vs. day 5 was not associated with increased aneuploidy in our experience. However, embryos that were not expanded at the time of biopsy, regardless of which day they were biopsied, were associated with significantly increased aneuploidy.