Embryonic Aneuploidy after Preimplantation Genetic Screening: Age- and Indication-Matched Comparative Study between Indian and Spanish Population

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ABSTRACT

Background: Recent studies show that there are differences in female fertility in different ethnic groups with ovarian aging and IVF treatment outcomes. Advanced maternal age is a known risk factor for miscarriage, accounting largely due to genetically abnormal fetus. **Aims and Objectives:** This study investigates if there are any differences in rates of embryo aneuploidy based on age and indications for preimplantation genetic screening (PGS) between Indian and Spanish women. **Materials and Methods:** This multicenter study was carried out at fertility centers in India and Spain. Data from autologous IVF cycles of women <45 years age (Spanish: 39.4 ± 3.8 years; Indian: 35.3 ± 4.6 years) were included. A total of 37,962 embryos from 7009 IVF cycles from Spain and 1894 embryos from 308 IVF cycles from India, having similar clinical indications, underwent similar IVF treatment protocol. The embryos were analyzed by PGS using either a day-3 or day-5/6 embryo biopsy. **Results:** Both Indian and Spanish ethnic population showed a reduction in aneuploidy rate in day-5/6 biopsy compared with day-3 biopsy (Spanish: 53.3% vs. 81.1%, $P < 0.01$; Indian: 50% vs. 75%, $P < 0.02$). There was a significant decrease in highly abnormal or chaotic embryos in trophectoderm biopsies compared with day-3 biopsies (Spanish: 2% vs. 16.1%, $P < 0.01$; Indian: 2.5% vs. 17.7%, $P < 0.01$). Both the populations showed similar trend in aneuploidy rate with maternal age. The results showed no significance between aneuploidy rate compared within different age groups and indications. However, there was a significant reduction in the miscarriage rate in Spanish population in day-3 biopsy compared with Indian population (10.7% vs. 19.8%; $P < 0.05$; 95% confidence interval [0.0044–0.0712]). There were no differences in the clinical outcomes compared between the two populations. **Conclusion:** This study shows that the aneuploidy rates between Indian and Spanish women of the same age group undergoing IVF treatment do not differ. An in-depth analysis to compare the types of anomalies reported with PGS in both the population will be of much interest.

KEYWORDS: *Aneuploidy, array comparative genomic hybridization, chromosome aberrations, ethnic comparison, preimplantation genetic screening*