

P-10 Preimplantation Genetic Diagnosis for Aneuploidy Screening in Patients with Poor Reproductive Outcome

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Background & Objectives: Aneuploidies of embryos are related to implantation failure or miscarriage. The risk of aneuploid embryo increases in advanced maternal age or parental karyotype abnormality and it results in poor reproductive outcomes such as recurrent spontaneous abortion (RSA) or recurrent implantation failure (RIF). Preimplantation genetic diagnosis for aneuploidy screening (PGD-AS) can be applied to these patients with poor reproductive outcome for better ART outcome by selecting chromosomally normal embryos. The aim of this study is to evaluate the clinical outcome of PGD-AS and which group can get much benefit from PGD-AS among the patients expected to have poor reproductive outcome.

Method: PGD-AS was performed in 48 cycles of 31 patients with poor reproductive outcome from May 1999 to December 2003. Patients were divided into 3 groups: group I - RIF more than 3 times (n=11, mean age = 42.2 yrs.), group II - RSA (≥ 3 times) associated with aneuploidy (n=19, mean age = 38.9 yrs.), group III - parental sex chromosome abnormality (n=18, mean age = 29.6 yrs.) including Turner syndrome (45,X/46,XX or 47,XXX/45,X/46,XX), Klinefelter syndrome (47,XXY or 47,XXY/46,XY or 48,XXXY/47,XXY/46,XY) and 47,XYY. Ovarian stimulation was done using GnRH agonist/FSH/HMG midluteal long protocol. Oocytes were inseminated by ICSI and the blastomeres were biopsied at 6~10 cell stage by drilling with Acid Tyrode's. PGD was performed by using FISH for chromosome 13, 16, 18, 21, X and Y in group I and II, and chromosome X, Y and 18/17 in group III. The embryos diagnosed to be chromosomally normal were replaced 4 days after oocyte retrieval.

Results: Blastomere biopsy was successful in 481 embryos and FISH efficiency was 93.1%. The proportions of transferable embryos for the tested probes were 27.9%, 20.5% and 51.2%, respectively in each group showing higher normal rate in group III (group II vs. III, $p < 0.05$). The number of transferred embryos was 3.9 ± 1.5 , 2.0 ± 1.2 and 3.1 ± 1.5 (mean \pm SD), respectively. The clinical pregnancy rate per transfer was 0%, 35.7% and 16.7%, respectively and significantly higher in group II ($p < 0.05$). The overall pregnancy rate was 18.6 % (8/43). Only 2 biochemical pregnancies occurred in group I. Eight healthy babies (one twin pregnancy) were born with normal karyotype and one case was aborted with normal karyotype.

Conclusions: Our data suggest that PGD-AS provides advantages in patients with poor reproductive outcome, especially with previous RSA associated with aneuploidy or sex chromosome abnormality. PGD-AS does not seem to be beneficial in RIF group in our study due to advanced maternal age and other detrimental factors involved in implantation. Further comprehensive analysis for other autosomes and in more cases of proper indication might be needed.