

O-23 Improvement of PGD with FISH Outcome in Human IVF-ET Program by the Laboratory Experiences and Optimization

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Objectives: Preimplantation genetic diagnosis (PGD) has been widely applied for structural chromosomal aberrations and gene defects. In this study, we want to point out the laboratory experiences for successful PGD with fluorescent in situ hybridization (FISH) and clinical outcome from our several years of clinical PGD experience.

Materials and Methods: From 1997 to 2002, a total of 200 PGD with FISH cycles of 111 couples were performed, and diagnosed the chromosome normality in the preimplantation embryos. We evaluated the following aspects in the PGD procedure. Suitable FISH probe was essential for the PGD, and it could be tested using lymphocytes with chromosomal aberrations. The blastomere biopsy technique to minimize the damage for the embryo and the culture media of biopsied embryos were important for the viability of biopsied embryos. Removal of cytoplasmic and nucleic proteins was needed for good and exact analysis of FISH signals. The subjects were divided by the following optimization steps. Phase-1: Blastomere biopsy (BB) with two kinds of pipettes, removal of proteins (RP) without treatment of pepsin and culture of biopsied embryos (CBE) with HTF medium; Phase-2: BB with single pipette, RP with pepsin and CBE with HTF medium; Phase-3: BB with single pipette, RP with pepsin and CBE with sequential (G1.2-G2.2) medium.

Results: A total of 3511 oocytes were collected, and 87.5% (2442/2790) of fertilization rate was obtained by ICSI. The successful blastomere biopsies were accomplished in 98.7% (2197/2225), and the successful diagnosis rate of FISH was 95.1% (2089/2197) from overall data. There was no difference in the successful biopsy and diagnosis rate among Phase-1, -2 and -3. However, the pregnancy rate of Phase-3 (33.1%, 39/118) was significantly ($p < 0.01$) higher than those of Phase-1 (13.2%, 5/38) and Phase-2 (9.1%, 4/44).

Conclusions: The laboratory experiences and optimization for the PGD with FISH can increase the pregnancy rate to 33.1% in the human IVF-ET program. Our facility of PGD with FISH provides the great possibility to get a normal pregnancy for the concerned couples by chromosomal aberrations.