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Trophectoderm biopsy among the different growth blastocyst stages for preimplantation genetic diagnosis

T. Nakano, Y. Akamatsu, M. Satoh, S. Hashimoto, T. Himeno,Y. Ohnishi,
T. Inoue, K. Ito, Y. Nakaoka, Y. Morimoto
IVF NAMBA CLINIC, the Centre for Reproductive Medicine and Infertility, Osaka, Japan

A single blastomere is usually obtained from a day 3 embryo for preimplantation genetic diagnosis (PGD) of chromosomal abnormalities using fluorescence in situ hybridization (FISH). Recently, with advances in molecular-biological techniques, an array comparative genomic hybridization (aCGH), which can provide more accurate and informative results on chromosomal abnormalities, has been developed for PGD. The aCGH requires a larger number of cells to reduce the risk of diagnostic error. Therefore, blastocyst biopsy is believed to be better than embryo biopsy. The aim of the present study was to assess the optimal blastocyst stage for trophectoderm biopsy, from the standpoint of the biopsied cell number and the survival rate of the frozen-thawed blastocysts. A average numbers of biopsied cells from early, full, expanded and hatched blastocysts were 3.8 ± 0.5, 7.9 ± 0.8, 7.8 ± 0.9 and 10.8 ± 1.0, respectively. Moreover, average numbers of biopsied live cells were 2.6 ± 0.5, 5.6 ± 0.6, 5.1 ± 0.5 and 8.1 ± 0.8, respectively. The numbers of live cells in the early blastocyst was significantly fewer than those in the other blastocyst stages ($P < 0.05$). The survival rates of frozen-thawed blastocysts were 87.5% (7/8), 90.0% (9/10), 88.9% (8/9), 88.9% (8/9), respectively. There were no significant differences in the survival rates of the frozen-thawed blastocysts among the blastocyst stages. Results of the present study show that biopsy at early blastocyst stage should be delayed until they develop to at least full blastocyst stage.