Chromosome Aberrations in Porcine Embryo Produced by Nuclear Transfer with Somatic Cell

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Nuclear transfer (NT) techniques have advanced in the last years, and cloned animals have been produced by using somatic cells in several species including pig. However, it is difficult that the nuclear transfer porcine embryos development to blastocyst stage overcoming the cell block *in vitro*. Abnormal segregation of chromosomes in nuclear transferred embryos on genome activation stage bring about embryo degeneration, abnormal blastocyst, delayed and low embryo development. Thus, we are evaluated that the correlations of the frequency of embryo developmental rates and chromosome aberration in NT and *In vitro* fertilization (IVF) derived embryo. We are used for ear-skin-fibroblast cell in NT. If only karyotyping of embryonic cells are chromosomally abnormal, they may difficultly remain undetected. Then, we evaluate the chromosome aberrations, fluorescent *in situ* hybridization (FISH) with porcine chromosome 1 submetacentric specific DNA probe were excuted. In normal diploid cell nucleus, two hybridization signal was detected. In contrast, abnormal cell figured one or three over signals. The developmental rates of NT and IVF embryos were 55% vs 63%, 32% vs 33% and 13% vs 17% in 2 cell, 8 cell and blastocyst, respectively. When looking at the types of chromosome aberration, the detection of aneuploidy at Day 3 on the embryo culture. The percentage of chromosome aneuploidy of NT and IVF at 4-cell stage 40.0%, 31.3%, respectively. This result indicate that chromosomal abnormalities are associated with low developmental rate in porcine NT embryo. It is also suggest that abnormal porcine embryos produced by NT associated with lower implantation rate, increase abortion rate and production of abnormal fetuses.

keywords) *Nuclear Transfer, Cloned animal, Chromosome aberrations, FISH, abnormal porcine embryo*