O-3(임상) Proliferation of Human Granulose Cells from Stimulation Cycles Could be a Positive Indicator for Proper Ovarian Hyperstimulation

Won Yun Choi, Jin Hee Eum, Eun A Park, Dong Ryul Lee, Woo Sik Lee, Tae Ki Yoon

Fertility Center of CHA General Hospital, CHA Research Institute, Pochon CHA University, Seoul, Korea

Background & Objectives: Proper ovarian hyperstimulation for good quality oocytes is one of the main contributors to the success of human in vitro fertilization-embryo transfer (IVF-ET) program. So, identification of markers, which imply proper stimulation protocol for patients, should be helpful on the improvement of human ART program. Several characteristics of human granulosa cells (GCs) obtained from IVF-ET program have been studied for estimating the outcome. The purpose of this study was to find the correlation between the degree of proliferation and the outcome of the IVF-ET cycle.

Method: GCs were recovered from follicular fluids obtained from 110 patients undergone consecutive IVF cycles, and cultured for 7~10 days. Proliferation of GCs were analyzed by microscopical analysis and confirmed by proliferating cell nuclear antigen (PCNA) staining. Cultured GCs were passaged and sampled for the expression of GCs markers (MCSF and MCSF-R) by RT-PCR analysis. Patients were classified into three groups based on the level of proliferating GCs (Group 1: a high percentages (30~100%) of proliferating GCs and well passed more than 4 passages; Group 2: a medium percentage (5~29%) of proliferating GCs; Group 3: a low percentage (0~4%) of proliferating GCs). The relationship between the proliferation of GCs and IVF outcome was analyzed.

Results: There was no difference in stimulation protocols and clinical profile among three groups. Pregnancy rate of Group 1 was significantly high compared to that of Group 2 or Group 3 (89.47% (34/38) vs. 40.62% (13/32) or 0% (0/40), $p<0.05$). Quality of embryo in Group 1 was also higher than those in Group 3. High pregnancy rate was obtained in patients showing high expression of MCSF and proliferation of primed GCs.

Conclusions: From these results, we found the positive relationship between proliferation assay from granulose lutein cell culture and the characteristics of the cycles from which cells were obtained. Therefore, proliferation of human GCs could be a useful indicator for proper ovarian hyperstimulation in order to obtain oocytes with good quality.