Intracytoplasmic sperm injection (ICSI) of one and two day(s)-old oocytes after complete *in vitro* fertilization (IVF) failure

M.A.Akhondi (Ph.D.),[1,4] M.Ghaffari (M.D.,Ph.D.),[2] A. Moeini (M.D.),[3] M.Ashrafi (M.D.),[3] Tehrani (M.D.)[3], M.R.Sadeghi (Ph.D.)[2], L.Karimiyan (M.Sc.)[3].

1- Assistant Professor of Genetic, Biotechnology & Embryology Department, Avesina Research Center, Tehran, Iran.
2- Assistant Professor of Reproductive Endocrinology Department, Avesina Research Center, Tehran, Iran.
3- Assistant Professor of Endocrinology & Infertility Department, Royan Research Center, Tehran,Iran.
4- Member of Infertility team of Royan Research Center, Tehran,Iran.

Abstract

The objective of this study was to evaluate the outcome of late (one and two days) Intracytoplasmic sperm injection (ICSI) after total fertilization failure in IVF. 35 IVF cycles that were part of our regular IVF program and showed no evidence of fertilization 16-46 hours after insemination (oocytes were observed at 16-18 hours and again 42-44 hours after the IVF procedures), were assigned to two treatment groups. Assisted fertilization with ICSI was carried out at 24 and 48 hours after oocyte retrieval. Group I (injected-day 1),consisted of 21 patients with 72 failed-fertilized metaphase II oocytes injected 1 day after ovum pick-up; and group II (injected-day 2), included 14 patients with 45 failed-fertilized metaphase II oocytes injected 2 days after ovum pick-up. A single spermatozoon from the patient's husband (same as that used for insemination in IVF program) was injected into the cytoplasm of each of these oocytes. Resultant embryos were transferred 72 and 96 hours after oocyte retrieval in group I and II, respectively. Fertilization was achieved with ICSI in most patients with fertilization failure. In group I, (80.5%) oocytes fertilized, whereas in group II, 46.6% of oocytes fertilized. Cleavage rate was 79.3% of injected oocytes in group I, and 42.8% in group II. Finally, in group one 19 of 21 (94%) embryos well transferred. The transfer rate for group two was 11 of 14 (78%). These results indicate significant differences between fertilization and cleavage rates in both groups. One of the singleton pregnancies resulted from transfer of the embryos in group II, and none in group I. This is the first known pregnancy achieved from late (two days) ICSI and late transferred embryos, after failed IVF. In conclusion, late (24 and 48 hours) ICSI after complete failed fertilization in IVF, can give good fertilization and good cleavage rates. This method can be used as an ideal protocol in IVF programs, to increase chance of pregnancy in infertile couples using the advantages of two main assisted reproductive treatments including IVF and ICSI.

Keywords: Fertilization failure, Late ICSI, Failed IVF, Reinsemination.
Corresponding address: Avesina Research Center P.O. BOX.19835-177, Tehran, Iran.
E-mail: M_Akhondi@yahoo.com