Abstract: Recent reports have suggested that when unfertilized oocytes with a spermatozoon after intracytoplasmic sperm injection (ICSI) are properly activated, the activated oocytes develop normally similar to fertilized oocytes. However, human oocytes do not easily respond to universal activators of mammalian oocytes like ethanol or calcium ionophore A23187, which induce a calcium transient in ooplasm. Puromycin activates human oocytes at a rate of 90%, but more than two thirds of the parthenogenones possess 2 haploid pronuclei or 1 diploid pronucleus without extrusion of the second polar body. Therefore, the activation method which produces one pronucleus with extrusion of the second polar body in oocytes without a spermatozoon is necessary for producing embryos with normal karyotypes. Recently, we found the oocyte activation method which produced parthenogenones displaying one pronucleus with extrusion of the second polar body. Using our method (a combination of calcium ionophore A23187 and puromycin), the activation rate was approximately 90% and the proportion of parthenogenones displaying one pronucleus with extrusion of the second polar body was approximately 80% in human aged and mouse young oocytes. When human unfertilized oocytes following ICSI were activated by this method, two pronuclei were formed with extrusion of the second polar body in 30% of the oocytes. Four cleaved parthenogenones (or embryos) showed normal karyotypes. However, the cytotoxic, teratogenetic and mutagenetic activity of Ca ionophore and puromycin should be approved prior to the clinical adaptation of the method. J. Med. Invest. 47 : 1-8, 2000

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