

Effect of Exposure to Vitrification Solutions on Maturation and Cleavage Rates of Immature Porcine Oocytes *In Vitro*.

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This study was conducted to investigate the effect of vitrification solution (VS) on *in vitro* developmental competence of immature porcine oocytes. The immature porcine oocytes were exposed to the following vitrification solution, at RT. 1) EFS sol. : 20% ethylene glycol (EG) 3 min, 40% EG + 18% (w/v) Ficoll (MV70,000) + 0.3 M sucrose 30 sec, 2) GE sol. : 10% glycerol 5 min, 10% G + 20% EG 5 min, 25% G + 25% EG 30 sec, 3) EG sol. : 1.5 M EG 2.5 min, 5.5 M EG + 1.0 M sucrose 30 sec. Oocytes were immediately transferred into 1.0 M, 0.5 M, 0.25 M, 0.125 M, 0 M sucrose solution for 2.5 min each at RT. After removal of VS, immature oocytes were matured *in vitro* and subsequently all oocytes were subjected to IVF followed *in vitro* culture for 7 days.

Maturation rates of oocytes were 38.8%, 44.5%, 22.4% and 57.6%, in EFS, EG, GE and Control, respectively, maturation rates of oocytes in EG and Control was significantly higher than EFS and GE ($P < 0.01$). Fertilization rates of oocytes in Control was significantly higher than other treated groups ($P < 0.05$), but no difference were observed among treated groups. Polyspermic rates were no significant difference among four groups. Cleavage rates of oocytes were 21.9%, 47.1%, 19.0% and 65.9%, in EFS, EG, GE and Control, respectively, cleavage rates of oocytes in EG and Control was significantly higher than EFS and GE ($P < 0.05$), but blastocyst formation rates were no significant difference among four groups. These results suggested that the use of EG solution could be a great challenge for reaching a successful vitrification of immature porcine oocytes.

Key words) *immature porcine oocyte, vitrification solution, exposure.*