EFFECTS OF SPERM MOVEMENT ON ICSI-DERIVED EMBRYO DEVELOPMENT IN GOAT

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The role of sperm is important to determine the success of intracytoplasmic sperm injection (ICSI) procedure to fertilise the oocytes as well as to increase the fertilisation, cleavage, pregnancy and birth rates in goat. Sperm motility is correlated with ICSI outcomes as motility reflects sperm vitality to result in successful fertilisation and subsequent developmental competence (Goto, 1997). In a standard ICSI procedure, the sperm is normally immobilised prior to its injection into the oocyte. It has been shown that embryos can be obtained by injection of dead sperm in ICSI procedure, whereby the sperm nucleus is still intact and is able to fertilise the oocyte successfully. It has been shown that dead embryos correlated well with in order to reduce the possibility of degenerated DNA from totally dead sperm. However, in natural fertilisation in the female reproductive tract, sperm motility is important to ensure the success of fertilisation. Consequently, the sperm that are no longer motile will not be able to fertilise the oocytes. It is logical that low motility rate of sperm may contribute to lower rate of embryos obtained in vivo and in vitro. Therefore, in clinical and industrial situation, selection of highly motile sperm is preferred for ICSI procedures in mammalian species including goats. Due to lack of information as well as controversial issues regarding the sperm and ICSI performance relationship, therefore, it is timely to study factors such as sperm motility characteristics relating to ICSI performance in order to clarify the underlying factors so that this technique can be applied integratively with other technologies in advance farm management for the goat industry. Therefore, the objective of this study was to produce embryos via ICSI technique using slow and rapid movement of sperm in goats.

The source of oocytes was obtained from oocytes retrieval (OR) through the laparoscopic oocyte pick-up (LOPU) technique. The donor does were synchronised and superovulated using (CIDR) followed by injection of gonadotrophin (PMSG and Ovidrel) before oocytes retrieval by LOPU technique. A total 97 of matured oocytes were used for ICSI for this study and were randomly assign to combinations of sperm movement (slow and rapid) and grades of oocytes (A, B and C). The oocytes were matured and ICSI procedure was carried out according to the different combinations of treatments. Cleavage rates were obtained for each treatment combination by observation on the embryonic development daily using stereomicroscope for 7 consecutive days.

The results have shown that the percentage of cleaved oocytes in rapid sperm movement was higher than that of slow movement group (69.23% vs. 64.44%, respectively). The embryos developed in vitro until the morula stage (13.46% vs 2.22%, respectively). There was one embryo successfully developed until blastocysts stage from the rapid movement sperm (1.92%). In conclusion, both rapid and slow movement sperm could be used to produce goat embryos using ICSI procedure with rapid sperm movement gives better ICSI performance than slow movement.