Effect of Sperm Heat Stress on Embryo Development in Cattle

CG Hur, SR Cho, JR Chong¹, JG Lee, HJ Lee¹, CS Park, SY Choe¹
Division of Applied Life Science, ¹Institute of Animal Medicine,
College of Veterinary Medicine, Gyeongsang National University

Heat stress to bovine oocytes and embryos has suggested a potential role of retardation of their development. Limited study has reported on the effect of heat shock on sperm before using it for IVF. Caudal epididymal sperm cultured in 42°C incubator for 0.5, 1 and 2 h compared on sperm viability and oocyte development after its use for IVF to those of control. Oocytes were matured for 22 h and then inseminated with treated or control sperm for 16 h. Embryos were cultured in CR1aa medium, transferred to TCM199+10% FBS on day 4, and maintained on day 9. A higher proportion (84.1%, 0.5 h: 72%, 1 h: 65%, 2 h) in treated sperm was observed dead and abnormal pattern as 100% of consider as control. In control the rates of cleavage and development into blastocyst were 76% and 22%, respectively, and did not differ the rates between 1 h and 2 h of culture. Significant differences were appeared in the rates between treated for an hour and control (32% and 5% vs. 54% and 10%, respectively). Moreover increased time of culture is more retardation to be cleaved the oocytes. However, the rates of blastocyst from cleaved embryos in treated group similar to control (25% vs. 29%, respectively). The reason for this remains unclear, but male sperm, from preliminary experiment (data un–shown) for sexing of resulting embryos, would be more fragility on heat stress.

(Key words) heat stress, sperm, embryo, bovine

Supported by the MAF–SGRP (Ministry of Agriculture and Forestry Special grants research program, 300012–5) in Korea.