

Effects of β -Mercaptoethanol on Lipid Peroxidation and Fertilization Ability *In Vitro* by Xanthine-Xanthine Oxidase System in Pig

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This study was undertaken to evaluate the effects of β -mercaptoethanol on lipid peroxidation and fertilization ability *in vitro* by xanthine (X)-xanthine oxidase (XO) system in boar spermatozoa frozen-thawed. When spermatozoa were inseminated in medium with X and/or XO, the penetration rates in all conditions were higher in medium with that than without β -mercaptoethanol. However, significant differences were not observed between medium with and without β -mercaptoethanol. The lipid peroxidation of sperm was evaluated on the basis of malondialdehyde (MDA) production. The MDA were higher in sperm treated without that than with β -mercaptoethanol under the above all conditions. However, significant differences were not observed between medium with and without β -mercaptoethanol. On the other hand, sperm-SH group were lower detected in medium with that than without β -mercaptoethanol in medium with X, XO or X+XO. The boar spermatozoa were treated with X and/or XO, and the spermatozoa ability were assessed with CTC. The percentage of spermatozoa that reached acrosome reaction were higher in sperm treated without that than with β -mercaptoethanol in medium with control, X or X+XO. The levels of viability in boar spermatozoa were measured by the eosin-nigrosin stain. In control group, level of viability in boar spermatozoa were higher than in medium with X, XO and X+XO groups. No significant differences, however, were observed under the all conditions. The activity of sperm binding to zona pellucida was also evaluated through binding to salt-stored porcine oocytes. In control group, sperm binding to zona pellucida were significantly ($P < 0.05$) higher than in medium with X, XO and X+XO groups. The sperm binding in all conditions were higher in medium with that than without β -mercaptoethanol. However, significant differences were not observed between medium with and without β -mercaptoethanol. In conclusion, addition of β -mercaptoethanol in X-XO system may play a positive role in improving of fertilization ability *in vitro*. This work was supported by grant No. R01-2000-00208 from the Basic Research Program of the Korea Science & Engineering Foundation.

Key words) *β -mercaptoethanol, lipid peroxidation, fertilization ability, pig, xanthine-xanthine oxidase*