

The morphological changes of acrosome and sperm nucleus in the ooplasm after intracytoplasmic sperm injection in pigs

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INTRODUCTION: Intracytoplasmic sperm injection (ICSI) bypasses the sperm-oolemma interactions that depend on completion of the acrosome reaction in normal fertilization. Morphological changes in the acrosomes of spermatozoa in the ooplasm were therefore examined following ICSI using pig gametes.

METHODS: In vitro matured porcine oocytes were provided for ICSI or *in vitro* fertilization (IVF). Oocytes were then stained with fluorescein isothiocyanate conjugated peanut agglutinin (FITC-PNA), which specifically labels the outer acrosomal membrane of boar spermatozoa, followed by observation under a confocal laser scanning microscope.

RESULTS: In ICSI, PNA showed disintegrated acrosomes classified into four categories. Heterogeneous chromatin decondensation was observed in the spermatozoa with intact/disintegrated acrosome whereas acrosome was hardly detected in the oocytes which had formed a male pronucleus. PNA-positive tails were concomitantly observed with the one type of disintegrated acrosome as in spermatozoa presumably acrosome reacted in IVF.

CONCLUSIONS: The PNA-binding properties of sperm head components introduced into the ooplasm are different from those after IVF. The delay of sperm chromatin decondensation is associated with that of acrosomal disassembly. Acrosomes appear to disintegrate in the ooplasm with or without the acrosome reaction.