

Journal of Andrology, Vol 16, Issue 1 47-54, Copyright © 1995 by The American Society of Andrology

JOURNAL ARTICLE

Capacitation in vitro of stallion spermatozoa: comparison of progesterone-induced acrosome reactions in fertile and subfertile males

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Mammalian sperm that have completed capacitation are capable of undergoing the acrosome reaction in response to a number of biological and chemical stimuli. In the present report, we have investigated the ability of progesterone to stimulate acrosome reactions of stallion sperm capacitated in vitro. Motile sperm were selected by a two-layer Percoll gradient centrifugation and were incubated in TALP medium modified by the 1:1 (v/v) addition of TEST-yolk medium for 5 hours at 39 degrees C, under 5% CO₂ in humidified air. Sperm incubated in vitro in TALP-TEST medium had a higher percentage of acrosome reactions following the addition of progesterone (3.18 μmol/L) compared to controls ($P < 0.05$). Furthermore, sperm from stallions classified as fertile on the basis of breeding history had higher percentages of progesterone-induced acrosome reactions in comparison with stallions classified as subfertile ($P < 0.05$). Acrosome reactions were assessed routinely by fluoresceinated lectin binding, but the physiological appearance of induced acrosome reactions was confirmed at the ultrastructural level by transmission electron microscopy. We conclude that 1) TALP-TEST medium supports stallion sperm capacitation in vitro, 2) progesterone-induced acrosome reactions are physiological, and 3) sperm from fertile stallions may be more responsive to progesterone-induced acrosome reactions than those of subfertile stallions. This is the first report in a nonhuman species that differences exist between the sperm of fertile and subfertile males in the ability to capacitate and acrosome react in vitro. (ABSTRACT TRUNCATED AT 250 WORDS)

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