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JOURNAL ARTICLE

Release of angiotensin-converting enzyme (ACE) from human spermatozoa during capacitation and acrosome reaction

F. M. Kohn, W. Miska and W. B. Schill

Department of Dermatology and Andrology, Justus Liebig University, Giessen, Germany.

The present study examines the release of angiotensin-converting enzyme (ACE) from human spermatozoa during capacitation conditions and in correlation to acrosome reaction and cell death. The ACE content of spermatozoa was measured by treating the cells with different detergents. Glass wool-filtered and washed human spermatozoa were incubated for 3 hours at 37 degrees C. Percentages of acrosome-reacted and dead spermatozoa did not change significantly, but the ACE release increased from 0 to 2.93 ± 0.44 mU/100 x 10^6 spermatozoa after 180 minutes ($P < 0.001$). In order to study the influence of acrosome reaction on ACE release, the acrosome reaction of noncapacitated spermatozoa was induced by 10 micromolar calcium ionophore A23187. The percentages of acrosome reaction and viability in noncapacitated spermatozoa as well as the ACE release were compared to corresponding data from experiments using capacitated spermatozoa (3 hours, 37 degrees C) from the same donors. Although the number of living acrosome-reacted spermatozoa after ionophore treatment ($30.5 \pm 4.0\%$) was significantly higher than after capacitation ($13.3 \pm 2.8\%$, $P < 0.001$), ACE release from ionophore-treated, noncapacitated spermatozoa was lower ($P < 0.05$). The data indicate that ACE release from human spermatozoa during capacitation is independent of acrosome reaction. Measurement of ACE release may be a clinically useful assay for human sperm capacitation.

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