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Evaluation of human sperm hyperactivated motility and its relationship with the zona-free hamster oocyte sperm penetration assay

C. Wang, A. Leung, W. L. Tsoi, J. Leung, V. Ng, K. F. Lee and S. Y. Chan

Department of Medicine, University of Hong Kong, Queen Mary Hospital.

The authors studied hyperactivated motility of human spermatozoa as a method of evaluating capacitation by examining its relationship to results of zona-free hamster oocyte sperm penetration assays (SPA) of semen samples from 50 men attending the infertility clinic. Hyperactivated motility was assessed in the seminal plasma and after swim-up preparation of spermatozoa at 1, 3, and 24 hours of incubation in capacitation media using a computer-assisted semen analysis system equipped with a hyperactivation module. Hyperactivated motility reached a peak at 1 hour and plateaued at 3 hours. The percentage of spermatozoa in seminal plasma with star-spin hyperactivated motility was significantly lower in the group showing no penetration in the SPA. The hyperactivated motility characteristics did not differ in the groups with positive or negative penetration. Correlation analysis failed to show any significant relationship between the hyperactivated motility parameters and SPA score. When the hyperactivated motility characteristics were compared in samples with normal and abnormal semen analyses, the total percentage of spermatozoa with hyperactivated motility and the percentage with star-spin at 3 hours were significantly lower in the group with abnormal semen analysis. The data indicate that lower hyperactivated motility of spermatozoa was found in patients with a score of zero for SPA and in patients with abnormal semen analysis. It was concluded that although no direct correlations were found between the results of SPA and hyperactivated motility, evaluating hyperactivated motility may still be useful as an early indicator of capacitation abnormalities of human spermatozoa not measured by SPA.

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