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JOURNAL ARTICLE

Human sperm mitochondrial function related to motility: a flow and image cytometric assessment

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Current evaluation of male fertility, routinely estimated by sperm count, motility, and morphology, provides only crude information about the fertility state of individuals. Both flow and image cytometry were applied to mitochondrial activity and sperm motility respectively.

Sperm samples from fertile donors were concomitantly measured for Rhodamine 123 (Rh123) uptake (an estimation of mitochondrial

activity), percentage of dead cells, and motility characteristics, such as percentage of motility, curvilinear velocity, and amplitude of lateral head displacement. These measurements were done under experimental conditions known to modulate sperm motility (temperature and time course survival in a capacitating medium). Bimodal distributions were found for Rh123 uptake. Flow cytometry-derived parameters were essentially time-dependent whereas motility characteristics were primarily temperature-dependent. Correlations were found between various flow cytometry-derived parameters and motility characteristics. Most of the correlations were obtained after a 24 h incubation in a capacitating medium. The most significant correlation in every experimental condition concerned the percentage of motile spermatozoa and the Rh123 uptakes. The drop in motility observed after a 24 h incubation was paralleled by a markedly lower drop in mitochondrial activity. The data suggest that these two complementary techniques represent an improvement in basic and/or clinical assessment of the functional spermatozoa status.

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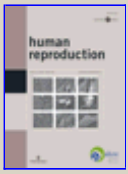
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