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JOURNAL ARTICLE

Continuous assessment of human spermatozoa viability during cryopreservation

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Cryomicroscopy has enabled direct observation of freezing and thawing of human spermatozoa. When used with a fluorescent viability kit, sperm membrane damage was not apparent down to temperatures of -5 degrees C, but significant damage occurred after thawing (55% of spermatozoa had damaged membranes). Semen samples were cooled or frozen to temperatures (at decrements of 10 degrees C) from 0 degree C to -110 degrees C. At all these temperatures the proportion of live to membrane-damaged cells remained constant. Samples held at temperatures above -30 degrees C were not adversely affected. Below -30 degrees C there was a gradual increase in the proportion of membrane-damaged cells on thaw and a decrease in the number of live cells recovering motility. At temperatures between -50 degrees C and -60 degrees C there was an equal proportion of live motile, immotile, and membrane-damaged cells. It is concluded that some irreversible damage to spermatozoa was a result of freezing processes in cells frozen to -30 degrees C or less, but most of the cryodamage was incurred during thawing, possibly due to recrystallization.

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