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Comparative evaluation of fresh and washed human sperm cryopreserved in vapor and liquid phases of liquid nitrogen

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Infectious organisms such as hepatitis B were recently shown to survive in liquid nitrogen. To prevent cross-contamination of semen samples via liquid nitrogen, studies were undertaken to evaluate human sperm survival in the vapor phase of liquid nitrogen at -189 degrees C. The study was conducted in 2 separate experiments. In the first experiment, a total of 30 unwashed, fresh semen samples (15 normozoospermic and 15 oligozoospermic) were evaluated for motility, vitality, and morphology after freeze-thaw survival in vaporous (-189 degrees C) and liquid nitrogen (-196 degrees C; control) phases. Similar evaluations were carried out in a second experiment on 27 samples (15 normozoospermic and 12 oligozoospermic) that were previously washed by the swim-up method. Motile sperm recovery rates were significantly different between liquid and vapor phases (unwashed, normozoospermic: 42.76% +/- 3.23% vs 45.52% +/- 4.44%, P < .05; washed, normozoospermic: 34.44% +/- 4.41% vs 37.58% +/- 3.90%, P < .05; unwashed, oligozoospermic: 16.53% +/- 3.34% vs 18.25% +/- 4.36%, P < .05; washed, oligozoospermic: 10.32% +/- 2.54% vs 12.25% +/- 2.81%, P < .05). Recovery rates for motility were much higher for unwashed samples compared with washed semen samples. In all experiments the recovery of normal and live forms showed no significant differences between the vapor and liquid nitrogen storage phases (P > .05). The results demonstrate that both washed and unwashed human sperm survive satisfactorily with good recovery in the vapor of liquid nitrogen and can be recommended for future storage in medically assisted conception programs.