A computer assisted sperm motility based study on rapid vs. slow thawing temperatures on human sperm motility parameters.

Objective: In animal studies it has been shown that very rapid thawing at 65°C for 7.5 seconds provided optimal preservation of sperm motility and acrosome integrity. Cellular damage may be caused during the thawing process as the ice melts or re-crystallizes. Slow thawing is most likely to induce injury, as it allows time for consolidation of microscopic ice crystals into larger forms, which are known to be damaging. Some workers have reported that thawing human sperm at 37°C for 10 min was superior to room temperature for 30 min. The purpose of this study was to compare the difference in sperm characteristics in post thaw semen samples undergoing slow (37°C) and rapid thaw (55°C) procedure.

Design: Prospective study.

Materials and Methods: The study includes 15 semen samples of men attending the Andrology Laboratory. Each semen sample after liquefaction was divided into two equal parts and frozen using glycerol-based cryoprotectant (Sperm Freeze, Ferti Cult™, Belgium). For the comparative study on thawing temperature and survivability, aliquots of the same samples were thawed at 37°C (10 minutes) and 55°C (3 minutes). Post-processing samples were analyzed using CASA (Hamilton-Thorn, CEROS) for motility parameters.

Results: Semen samples thawed at 55°C for 3 minute had higher % motility (12.0 ± 10.8 vs. 19.8 ± 12.7, P-value = 0.010) and % rapid forms (9.8 ± 9.8 vs. 15.3 ± 13.1, P = 0.030) compared to the sample thawed at 37°C. There were no significant differences in other CASA velocity parameters like VAP, VSL, VCL, ALH, BCF and linearity between the two groups.

Conclusion: Our results indicate that a short exposure to higher temperature may be beneficial to recover higher percentage of motile sperms from cryopreserved human semen. This may be due to a shortening of the re-crystallization time, an event that can have considerable impact on cell damage due to the physical and osmotic forces exerted at this stage.

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