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JOURNAL ARTICLE

Effect of cryoprotective additives and cryopreservation protocol on sperm membrane lipid peroxidation and recovery of motile human sperm

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Sperm membrane damage during cryopreservation reduces the recovery of motile sperm. The present study investigates changes in sperm motility and membrane lipid peroxidation (LPO) in response to two changes in the standard sperm cryopreservation/thawing methodology: 1) the addition of platelet-activating factor (PAF) and pentoxifylline (PTX) as cryoprotective additives, and 2) the alteration of sample thawing time. PAF (1 microM) and PTX (3 mM) were added to fresh sperm samples prior to cryopreservation. After 2 weeks the samples were thawed either quickly (5 minutes at 37 degrees C) or slowly (30 minutes at 4 degrees C) and evaluated for sperm motility and LPO. Thawing time influenced both post-thaw motility and LPO. Samples thawed quickly exhibited a 31% increase in motility recovery (35.2 +/- 4.3% in quick-thaw samples; 24.3 +/- 3.9% in slow-thaw samples) and a 23% lower LPO level (23.3 +/- 3.4% in quick-thaw samples; 30.09 +/- 4.4% in slow-thaw samples) compared to samples thawed slowly. Results also demonstrated that PAF (49 +/- 1.7%) or PTX (42.6 +/- 1.5%) enhance post-thaw motility in comparison to control (35.8 +/- 1.2%), whereas neither PAF nor PTX affect post-thaw LPO (19.1 +/- 2.2% in controls; 20.2 +/- 1.7% in PAF samples; 20.5 +/- 1.4% in PTX samples). These results support observations that there is a negative correlation between sperm motility and LPO in cryopreserved samples. The results also discount the hypothesis that LPO protection is a result of the cryoprotective action of PAF or PTX.

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