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JOURNAL ARTICLE

Characteristics of human sperm chromatin structure following an episode of influenza and high fever: a case study

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Semen samples from a fertile patient presenting with influenza and a 1-day fever of 39.9 degrees C were obtained and analyzed at 18-66 days postfever (dpf) for sperm nuclear proteins, DNA stainability, free thiols (-SH), and susceptibility to DNA denaturation in situ. At 18 dpf, 36% of sperm demonstrated denatured DNA as measured by the sperm chromatin structure assay (SCSA), and decreased to 23% by 39 dpf.

Samples at 33 and 39 dpf contained 49% and 30%, respectively, of cells with increased DNA stainability (HIGRN). A unique sperm nuclear protein band migrating between histones and protamines on acid-urea gels appeared at 33 and 39 dpf and nearly disappeared by 52 dpf. Amino acid sequencing of the first 8 N-terminal residues identified this protein as the precursor to protamine 2. The protamine P1 and P2 ratio remained normal, whereas the histone to protamine ratio increased slightly at 33 to 39 dpf. Flow cytometric measurements of nuclear -SH groups revealed the greatest reduction in free nuclear thiols at 33 dpf, and returned to normal by 45 dpf. The time of appearance of the unprocessed protamine 2 precursor and the relative increase in histone suggest a fever-related disruption of the synthesis of mRNA that codes for a P2 processing enzyme or enzymes. Increased DNA staining is likely due to the increased histone/protamine ratio. This case study demonstrates that fever/influenza can have latent effects on sperm chromatin structure and may result in transient release of abnormal sperm.

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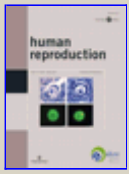
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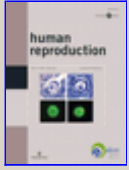
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