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JOURNAL ARTICLE

DNA integrity in human spermatozoa: relationships with semen quality

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The literature contains conflicting evidence regarding the existence of DNA damage in spermatozoa from infertile male patients. To examine this phenomenon, we have studied ejaculated spermatozoa from normozoospermic semen donors and from a group of the unselected male partners of couples attending an infertility clinic for initial investigation. Classical semen analysis according to World Health Organization (WHO) guidelines was undertaken with computer-assisted sperm analysis (CASA). Spermatozoa were prepared by sequential washing and centrifugation and were analyzed for DNA fragmentation using three assays: 1) a single-cell gel electrophoresis (comet) assay, 2) in situ nick translation with prior chemical decondensation (ISNT-decondensed), and 3) in situ nick translation without prior chemical decondensation (ISNT-condensed). In addition, reactive oxygen species (ROS) generation by spermatozoa was measured, and seminal plasma was analyzed for its total reactive antioxidant potential (TRAP). When the donor and patient groups were compared, the latter had lower levels of semen quality and higher levels of DNA damage, which was particularly apparent using the comet assay. Highly significant negative correlations were observed between DNA fragmentation, detected by all three assays, and semen quality, particularly sperm concentration. In addition, multiple regression analysis indicated that other attributes of semen quality, such as sperm movement and ROS generation, were also related to DNA damage. We conclude that a significant proportion of infertile men have elevated levels of DNA damage in their ejaculated spermatozoa.

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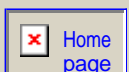
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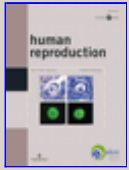
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▶ HOME

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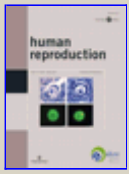
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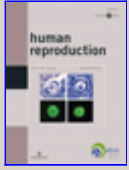
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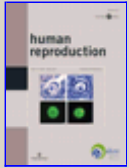
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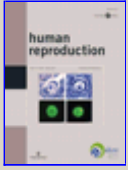
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