

Abstract

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Extent of sperm DNA damage in spermatozoa from men examined for infertility. Relationship with oxidative stress

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BACKGROUND: Cryptorchidism and oligozoospermia are clinical conditions closely associated with impaired fertility. Oxidative stress and related sperm DNA damage have been identified as significant causes of male infertility.

AIM: To determine the extent of sperm nuclear DNA damage in patients affected with idiopathic oligozoospermia or undescended testes and to examine its relationship with oxidative stress.

PATIENTS AND METHODS: We studied 20 patients with idiopathic oligozoospermia and 18 with undescended testes (who previously underwent orchiopexy) and 25 normozoospermic healthy controls. All subjects underwent semen analysis. Sperm DNA damage was evaluated by the sperm chromatin structure assay/flow cytometry (SCSA-FCM) and by the dUTP-biotin nick end labeling (TUNEL) assay. Levels of reactive oxygen species (ROS) and total antioxidant capacity (TAC) were assessed by a chemiluminescence assay.

RESULTS: DFI (percentage of sperm with denatured DNA) values and percentage of TUNEL positive cells were significantly greater in patients with oligozoospermia (DFI: 28.8+/-5.6; TUNEL+: 26.9+/-3.0) or cryptorchidism (DFI: 26.4+/-10.1; TUNEL+: 29.1+/-3.9), compared with controls (DFI: 7.1+/-0.9; TUNEL+: 14.2+/-1.2). Similarly, both groups of patients had significantly higher ($p < 0.01$) levels of ROS. TAC levels did not differ between control and patient groups, suggesting that the DNA damage occurs before spermiation.

CONCLUSIONS: Sperm DNA damage is significantly increased in men with idiopathic oligozoospermia and in cryptorchid subjects. The finding of increased ROS levels may indicate that seminal oxidative stress may be involved in the pathogenesis of sperm DNA damage in these patients.

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