

SPERM DNA DAMAGE IN NORMOSPERMIC MEN

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Introduction and Objectives: Semen analysis is the primary tool to assess the status of infertile men. However, a subset of men with normal semen parameters may still be infertile and are classified as idiopathic. Additional tests to determine the cause of infertility include measurement of reactive oxygen species (ROS) levels and sperm DNA damage. DNA damage in sperm has been recently reported as a very sensitive indicator of abnormal spermiogenesis and poor pregnancy outcome. In this study, we evaluated semen parameters, ROS production and DNA damage in healthy donors and in patients examined for infertility.

Methods: Semen samples were collected from 90 infertile men and 34 normal healthy male volunteers. Samples were centrifuged and resuspended in PBS medium. ROS production was measured by the chemiluminescence assays in the resulting sperm suspensions. DNA damage was assessed by the sperm chromatin structure assay in neat semen and results expressed as percent COMP_{at} values. Chi-square tests were used for statistical hypothesis testing.

Results: Although samples with abnormal semen parameters were more likely to be associated with elevated ROS levels than samples with normal semen parameters (66% versus 37%; $p=0.01$), this relationship was not found between semen parameters and sperm DNA damage (28% versus 33%; $p=0.65$). Also, elevated ROS levels per se were not significantly associated with increased DNA damage ($p=0.21$). Of the 90 patients, 27 (30%) had normal concentration, motility, and WHO morphology levels. Among these patients with normal semen parameters, 17 (63%) had ROS levels >1 million cpm and COMP_{at} values >30%. However, only 1 (4%) patient with normal semen parameters had these values. Also, of the 63 patients with at least one abnormal semen parameter, only 11 (17%) had both elevated ROS and COMP_{at}. Of the 30 donor samples with normal semen parameters, 5 (20%) had ROS levels >1 million cpm, 2 (7%) had COMP_{at} values >30%, and none had both.

Conclusions: Normal standard semen parameters are not always indicative of normal sperm function. The results of this study indicate that significant DNA damage, as measured by the SCSA assay, can be found in sperm from samples with normal semen parameters. In contrast, ROS production by washed spermatozoa was correlated with abnormal semen parameters. Therefore, patients diagnosed with unexplained male infertility should be evaluated for sperm DNA damage.