

# Abstract

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## Levels of oxidative stress biomarkers in seminal plasma and their relationship with seminal parameters.

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**BACKGROUND:** There is growing evidence that damage to spermatozoa by reactive oxygen species (ROS) play a key role in male infertility. The aim of the present study was to assess seminal plasma levels of total antioxidant capacity (TAC), free 8-Isoprostane and activities of catalase and superoxide dismutase (SOD) in men with asthenozoospermia, asthenoteratozoospermia and oligoasthenoteratozoospermia compared with normozoospermic males.

**METHODS:** The patients consisted of 46 men with seminal parameters abnormalities. The patients were grouped into asthenozoospermic (n = 15), asthenoteratozoospermic (n = 16) and oligoasthenoteratozoospermic (n = 15). The control group consisted of 16 healthy males with normozoospermia. Catalase activity was measured by Aebi spectrophotometric method. Levels of TAC and SOD were measured by commercially available colorimetric assays. Level of free 8-Isoprostane was assessed by commercially available enzyme immunoassay (EIA) method. Differences between groups were assessed using Mann-Whitney U test and Kruskal-Wallis test. Coefficients of correlation were calculated using Spearman's correlation analysis. All hypothesis tests were two-tailed with statistical significance assessed at the p value < 0.05 level with 95% confidence intervals.

**RESULTS:** Levels of catalase and TAC were significantly lower in patients than the control group. No significant changes were seen in SOD activities. Levels of free 8-Isoprostane were significantly higher in patients than the control group. Furthermore, asthenozoospermic, asthenoteratozoospermic and oligoasthenoteratozoospermic groups had significantly lower values of catalase activity and TAC when compared to normozoospermic males. Levels of free 8-Isoprostane were significantly higher in all patients subgroups than the control group. Levels of catalase and TAC were positively correlated with sperm motility and morphology. Free 8-Isoprostane levels showed an inverse correlation with sperm motility and morphology.

**CONCLUSION:** Decreasing seminal plasma antioxidants levels, especially catalase and TAC, could have significant role in etiology of impaired sperm function. Measurement of 8-Isoprostane may be used as a specific biomarker for assessing oxidative stress on sperm.

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