

# Abstract

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## Attenuation of oxidative stress after varicocelectomy in subfertile patients with varicocele.

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**PURPOSE:** We examined changes due to oxidative damage to spermatozoa and alterations in antioxidant capacity in subfertile patients with varicocele before and after varicocelectomy in a prospective study.

**MATERIALS AND METHODS:** A total of 30 young subfertile male patients with varicocele were recruited in this study. Varicocele was diagnosed by physical examination and Doppler ultrasound. Semen analysis was performed in the 30 patients before and 6 months after varicocelectomy using a computer assisted semen analyzer. The parameters for evaluating oxidative stress changes were 4977 bp deletion of mitochondrial DNA in sperm, as detected by polymerase chain reaction, the 8-OHdG (8-hydroxy-2'-deoxyguanosine) content in spermatozoa DNA, as measured by a high performance liquid chromatography electrochemical method, and seminal plasma protein thiols and ascorbic acid, as measured by spectrophotometric methods.

**RESULTS:** Semen quality, including motility, morphology and sperm density, was improved in 22 patients (73.3%) after varicocelectomy. The incidence of 4977 bp deletion of mitochondrial DNA in sperm was 40% (12 of 30 patients) and 13.3% (4 of 30) before and after surgery, respectively. Mean  $\pm$  SD 8-OHdG content in sperm DNA, and seminal plasma protein thiols and ascorbic acid were 10.27  $\pm$  2.24/10(5) 2'-deoxyguanosine, 0.77  $\pm$  0.75 nmole/ml and 1.87  $\pm$  0.40 mg/dl before operation, and 5.95  $\pm$  1.46/10(5) 2'-deoxyguanosine, 3.00  $\pm$  1.17 nmole/ml and 3.12  $\pm$  0.94 mg/dl after surgery, respectively. The incidence of 4977 bp deletion of mitochondrial DNA in sperm and the level of 8-OHdG in sperm DNA were decreased, and seminal plasma protein thiols and ascorbic acid were increased significantly in all 30 patients after varicocelectomy. Also, in the 8 patients in whom semen quality did not improve after surgery a significant decrease in 8-OHdG in sperm DNA, and a significant increase in seminal plasma protein thiols and ascorbic acid were observed.

**CONCLUSIONS:** Subfertile patients with varicocele had a significant decrease in oxidative damage in sperm DNA and an increase in antioxidant capacity in seminal plasma after varicocelectomy, indicating that surgery is effective treatment in such patients.

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