Result(s): Forty-six (44.2%) of 104 inseminated oocytes were fertilized in the study group compared with 65 (84.4%) of 77 in the control group, which was a significant difference. Surface-bound antisperm antibodies significantly inhibited early embryonic cleavage in the study group (13 [28.3%] of 46 embryos with at least 3 blastomeres) compared with the control group (41 [63.1%] of 65 embryos, with at least 3 blastomeres). The percentage of good-quality embryos (grades 1 and 2) was similar in the study and control groups (71.7% and 78.5%, respectively). The percentage of poor-quality embryos (grade 4 and two pronuclei) was higher in the study group compared with the control group (13.9% versus 9.2%, respectively); however, the difference was not significant. The implantation rate and clinical PR were lower in the study group (3% and 11%, respectively) compared with the control group (9.5% and 44%, respectively), but the difference was not statistically significant.

Conclusion(s): The fertilization rate and early embryonic cleavage of human embryos was found to be reduced significantly in patients with high levels of surface-bound antisperm antibodies. Moreover, embryonic quality and the PR may be compromised by the presence of significant levels of surface-bound antisperm antibodies.

Editorial Comment: Autoimmunity to sperm is detected by the presence of antibodies bound to the surface of live motile sperm. Men with positive antisperm antibody tests represent a heterogeneous population, since an autoimmune response may be monoclonal or polyclonal, and the sperm cell surface antigens to which the antibodies bind are unknown. In fact, in vitro studies have shown that antisperm antibodies from different sources may have different effects on the same semen sample, including impaired sperm-egg interaction, enhancement of sperm-egg interaction and no effect whatsoever.[1] The authors document a deleterious effect of antisperm antibodies detected by a mixed agglutination reaction test in an albeit small but carefully selected and well matched patient population undergoing therapeutic in vitro fertilization. More significantly, the authors also report that antisperm antibodies may have an adverse effect on embryonic development and uterine implantation. This observation is important, since few studies have demonstrated a significant paternal role in the post-fertilization events of pregnancy.

Jonathan P. Jarow, M.D.

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The Influence of Clinical and Subclinical Varicocele on Testicular Volume

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Fertil. Steril., **68:** 671–674, 1997

Objective: To examine the possible loss of testicular volume in infertile men with clinical and subclinical varicocele by using ultrasound (US)-derived measurements of testicular volume.

Design: Retrospective review of clinical and scrotal US reports.

Setting: University infertility clinic.

Patient(s): Infertile men (n = 404) presenting for evaluation from 1992 to 1996.

Intervention(s): None.

Main Outcome Measure(s): Presence of clinical or subclinical varicocele, US-derived measurements of testicular volume.

Result(s): In men with clinical left or subclinical left varicocele, left testicular volume was significantly less than right testicular volume (12.9 versus 14.1 and 13.2 versus 14.7 mL, respectively). This finding was not observed in men with bilateral clinical or bilateral subclinical varicoceles or in men without varicocele.

Conclusion(s): Our data confirm previous reports showing that a clinical left varicocele can negatively impact on left testicular volume and for the first time show that a subclinical varicocele is also associated with decreased left testicular volume.

Editorial Comment: Measurement of testicular volume is a useful clinical parameter, since approximately 80% of testicular volume is comprised of seminiferous tubules, and significant loss of testicular volume is a reliable indicator of abnormalities in spermatogenesis or testicular failure. However, the clinical significance of changes in testicular volume, which is so small that ultrasound measurement is required to detect it, remains unclear. Ipsilateral testicular atrophy associated with varicoceles has been noted since Celsus described it 2 millennia ago. The authors have carefully performed this retrospective analysis to document the loss of left testicular volume compared to the contralateral testis associated with clinically and ultrasound detected subclinical left unilateral varicocele. Furthermore, there was an inverse relationship between varicocele and absolute testicular volume. The lowest absolute left testicular volume was found in the patients with bilateral clinical varicoceles, followed by unilateral clinical varicoceles and then by unilateral subclinical varicoceles. Unfortunately, the accuracy of ultra-

sonographic diagnosis of subclinical varicoceles is only 60%. Therefore, conclusions regarding subclinical varicoceles based on studies using this method of diagnosis must be interpreted with caution. Nevertheless, the authors confirm the long-standing observation that varicoceles have a deleterious effect on the testis.

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Expression of Glutathione Peroxidases in the Adult Male Rat Reproductive Tract

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Fertil. Steril., **68:** 689–695, 1997

Objective: To evaluate the messenger RNA (mRNA) expression of three glutathione peroxidase isoforms in the male reproductive tract and to further characterize testicular glutathione peroxidase expression.

Design: Analysis of glutathione peroxidase levels in untreated animals.

Intervention(s): ^{32}P-labeled DNA probes were derived from known complementary DNA (cDNA) sequences for classic cellular glutathione peroxidase, phospholipid hydroperoxide glutathione peroxidase, and secretory epididymal glutathione peroxidase, and used to evaluate mRNA levels in each tissue by Northern blot hybridization.

Main Outcome Measure(s): Glutathione peroxidase mRNA concentrations.

Result(s): A 0.8-kb transcript was identified in liver, testis, prostate, seminal vesicle, vas deferens, and epididymis using the cDNA probe for classic cellular glutathione peroxidase. Using the probe for phospholipid hydroperoxide glutathione peroxidase, a 0.9-kb transcript was identified in the epididymis, vas deferens, prostate, seminal vesicle, and liver. In the testis, the phospholipid hydroperoxide glutathione peroxidase transcript was highly abundant and longer, measuring 1.1 kb. The phospholipid hydroperoxide glutathione peroxidase mRNA transcript was expressed in 40-, 60-, and 90-day-old rat testes, but was undetectable in testes of 10- and 20-day-old rats. Epididymal glutathione peroxidase was detected as a single 1.9-kb transcript in the caput epididymis only.

Conclusion(s): Male rat reproductive tissues express at least three different isozymes of glutathione peroxidase. Phospholipid hydroperoxide glutathione peroxidase and classic cellular glutathione peroxidase are primarily found in testis, whereas epididymal glutathione peroxidase is expressed in the epididymis.

Editorial Comment: Sperm are particularly vulnerable to damage by reactive oxygen species due to the high percentage of polyunsaturated fatty acids within their cell membranes. Yet sperm also appear to require low levels of seminal reactive oxygen species for normal capacitation and acrosome reaction. Therefore, the concentration of reactive oxygen species must be tightly controlled within the male reproductive tract and semen. Thus, one would anticipate multiple systems to control the concentration of free radicals within the male reproductive tract and seminal fluid. The authors elegantly demonstrate the expression of glutathione peroxidases in various male reproductive tissues using a rat animal model. Phospholipid hydroperoxide glutathione peroxidase messenger ribonucleic acid expression was highest within testicular tissue and its expression increased with testicular development. An epididymal glutathione peroxidase isozyme was also found with greatest expression in the caput. The putative role of these enzymes is to protect developing sperm from free radical damage within the testis, and then during transport and storage within the epididymis.

Jonathan P. Jarow, M.D.

Detection of Oxidative DNA Damage in Human Sperm and the Association With Cigarette Smoking

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The present study aims to evaluate oxidative DNA damage in human sperm and the association with cigarette smoking. The level of 8-hydroxydeoxyguanosine (8-OHdG) in sperm DNA, cotinine concentration in seminal plasma, and conventional seminal parameters such as semen volume, sperm density, viability, motility, and normal morphology were determined in 60 healthy subjects. It was found that the sperm DNA of smokers contained a significantly higher amount of 8-OHdG than that of nonsmokers (6.19 ± 1.71 vs. 3.93 ± 1.33 8-OHdG/10^5 dG, $P < 0.001$). The level of 8-OHdG in sperm DNA was also closely correlated to seminal cotinine concentration ($r = 0.38$, $P < 0.05$). These findings suggest that cigarette smoking enhances the extent of DNA damage in sperm. In contrast, no significant difference was observed for conventional parameters between smokers and nonsmokers, suggesting that the level of 8-OHdG in sperm may reflect the deleterious effect of cigarette smoking on sperm quality more accurately than conventional seminal