Infertile Varicocele Patients Spermatozoa Generate Elevated Levels of Reactive Oxygen Species. B. N. Hendin, R. K. Sharma, A. J. Thomas Jr., and A. Agarwal; Andrology Research & Clinical Laboratories, Dept. of Urology, Cleveland Clinic Foundation, Cleveland, OH

Objectives: Seminal reactive oxygen species (ROS) can be produced by spermatozoa and white blood cells (WBCs). High levels of ROS can cause damage to the spermatozoal membrane, resulting in reduced fertilizing potential. The aim of the present study was to measure the generation of ROS from the spermatozoa of infertile men with clinically evident varicoceles.

Design: A prospective study.

Materials and Methods: Fresh semen samples were obtained from infertile men with varicoceles (n = 15) and normal healthy donors (n = 10) after at least 48 to 72 hr of sexual abstinence. Following liquefaction, semen quality was assessed by a computer-assisted semen analyzer and results verified manually. Endtz staining test was performed on all specimens to evaluate for the presence of elevated leukocyte concentration (>1 X 10^6 WBC/mL). Controls consisted of Endtz negative specimens from non-infertile donors. ROS production from washed spermatozoa was measured by the addition of 5 mM luminol to a 400 µL sperm suspension containing ≤ 20 X 10^6 sperm/mL. Chemiluminescence was recorded over a 15 minute period using a Berthold Luminometer in the integrated mode. Results were expressed in units of log (counts X 10^4) per 20 million sperm.

Results: All varicocele patients tested negative for WBCs. Only 6 out of 15 patients showed minimal WBC presence (<0.5 X 10^6 WBC/mL). Elevated levels of ROS generation were observed in all varicocele patients; median and interquartile range were 2.32 (1.78 to 3.15), as compared to controls 1.13 (1.01 to 1.89) (P = 0.015).

Conclusions: Spermatozoa from infertile varicocele patients have elevated ROS generation. The prevalence of elevated ROS generation among varicocele patients, in the absence of leukocytospermia, suggests that ROS may mediate their sperm dysfunction.