Creatine Kinase Activity as a Measure of Sperm Quality in Subfertile Men. R.S. Sidhu, R.K Sharma, A.J. Thomas Jr., and A. Agarwal; Andrology Research & Clinical Laboratories, Dept of Urology, Cleveland Clinic Foundation, Cleveland, OH.

Objectives: Creatine kinase, a key enzyme in sperm energy transport, is an indicator of sperm maturity; its concentration correlates with spermatozoal fertilizing capacity. This study determined whether the creatine kinase levels correlate with semen quality in subfertile men.

Design: A prospective clinical study.

Materials and Methods: Semen samples from 78 subfertile and 16 healthy normal donors were obtained by masturbation after 48 to 72 h of sexual abstinence. Specimens were allowed to liquefy at 37°C, and sperm characteristics were assessed by a computer-assisted semen analyzer and manually verified. Sperm morphology was evaluated by Kruger's strict criteria and the WHO method. For comparison of creatine kinase levels, all subjects were also grouped as normal or abnormal by the WHO criteria based on their sperm concentration and motility. Thiobarbituric acid assay was used to determine lipid peroxidation levels, and sperm creatine kinase activity was measured after extraction with Triton-X using a CK test kit (Sigma Chemical Company, St. Louis, MO). The results were expressed as U/10^8 sperm.

Results: Creatine kinase levels were significantly higher in subfertile men [median and interquartile range, 0.197 (0.079 - 0.539)], than donors [0.061 (0.058 - 0.083); P <0.001]. In subfertile men, creatine kinase significantly correlated with lipid peroxidation (r = 0.49; P <0.024); sperm concentration (r = -0.7, P <0.001); normal forms by both Kruger's (r = -0.3, P <0.05) and WHO methods (r = -0.32, P <0.01), and abnormal tail forms by the WHO method (r = 0.33; P <0.005). No significant correlations were seen in normal healthy men. Creatine kinase activity was significantly higher in oligospermic subjects compared to normospermic men (P <0.001) and in men with asthenospermia compared to men with normal motility (P <0.001).

Conclusions: Significantly elevated levels of creatine kinase in subfertile men and its correlation with lipid peroxidation level reflect spermatozoal biochemical immaturity. Similarly, the inverse relationship between creatine kinase and sperm concentration and morphological forms suggests the late phase of spermatogenesis is inhibited in some subfertile men. The creatine kinase level appears to be a reliable biochemical marker in assessing semen quality in men with unexplained infertility.