Objective: The excessive reactive oxygen species production causes oxidative stress, resulting in decreased sperm motility, probably due to loss of intracellular ATP, decreased sperm viability, and increased mid-piece morphology defects with deleterious effect on sperm capacitation and acrosome reaction. Superoxide dismutase (SOD) and catalase are important antioxidant enzymes that can quench excess free radicals such as: superoxide anion and hydrogen peroxide respectively. Hyperviscosity of liquefied semen is a biophysical alteration of an ejaculate whose biochemical etiology is scarcely known and is reported to be associated with a higher incidence of abortions in patients undergoing intrauterine insemination. Hyperviscosity of the semen has been reported to be related to glandular dysfunction. The objective of our study was to evaluate the relationship between seminal antioxidants (SOD and catalase levels) in infertile men with the viscosity of the semen, semen parameters and leukocytospermia levels.

Design: Prospective study at tertiary care hospital

Materials and Methods: This study was approved by Institutional Review Board and the patients involved granted their informed consent. All patients were evaluated with a complete medical history, physical examination, and semen analyses. Hundred and twenty-five infertile patients were included in the study. Semen samples were obtained by masturbation after at least 48 hours of abstinence. Samples were collected into sterile containers and allowed to liquefy at 37°C for 30 minutes and analyzed for viscosity (normal, moderate, and high), sperm concentration, percent motility, and morphology according to WHO criteria. Superoxide dismutase and catalase levels were determined with a spectrophotometer. Leukocytospermia levels were evaluated with the Endtz test. The activity of the SOD was based on the adrenocromo concentration, resulting from the adrenaline oxidation by the radical superoxide. Catalase activity was determined by the velocity of hydrogen peroxide consume. Results: Significantly lower levels of SOD were seen in infertile patients with high viscosity (14.67 ± 5.27) compared to normal (23.17 ± 6.79; P = 0.03) or moderate viscosity (21.61 ± 7.12; P = 0.04) Significantly lower levels of catalase were seen in infertile patients with high viscosity (14.87 ± 6.95) compared to normal (27.12 ± 9.95; P = 0.02) or moderate viscosity (20.95 ± 4.49; P = 0.04). Sperm morphology by WHO criteria was significantly correlated with levels of SOD (r = 0.434, P = 0.000) and catalase (r = 0.395, P = 0.001). SOD was also correlated with sperm concentration (r = 0.303, P = 0.012) and percentage motility (r = 0.295, P = 0.014). A significant correlation between catalase and SOD was observed (r = 0.461, P = 0.000). Viscosity was correlated with the Endtz test (r = 0.235, P = 0.01). Neither SOD (r = -0.095, P = 0.11) nor catalase levels (r = -0.115, P = 0.09) were correlated with the Endtz test.

Conclusion: Diminished antioxidant capacity in infertile patients is associated with seminal hyperviscosity and leukocytospermia. High degree of correlation between sperm morphology and
antioxidant enzymes suggests the ability of abnormal spermatozoa to produce reactive oxygen species resulting in reduced levels of antioxidant enzyme.

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