Title: Association of classical semen parameters with superoxide dismutase and catalase activities in human semen
Maria Bykova, Dipl.Specialist, agarwaa@ccf.org, Nadegda Titova, Ph.D., Rakesh Sharma, Ph.D, sharmar@ccf.org and Ashok Agarwal, Ph.D,HCLD, agarwaa@ccf.org. 1Reproductive Research Center, Glickman Urological Institute, Cleveland clinic, Cleveland, Ohio, United States, 44195 and 2Department of Biochemistry and Physiology of Human and Animals, Siberian Federal University, Krasnoyarsk, Russian Federation.

Objective: Significant amounts of superoxide dismutase (SOD) in cellular and extracellular environments are crucial for the prevention of diseases linked to oxidative stress. Catalase is involved in the detoxification of hydrogen peroxide (H₂O₂), a toxic product of both normal aerobic metabolism and pathogenic generation of reactive oxygen species (ROS) production. The aim of our study was to determine levels of SOD and CAT in spermatozoa and seminal plasma of partners of couples enrolled in ART clinic.

Design: Prospective study

Materials and Methods: A total of 151 patients were grouped according to their semen characteristics: group 1: normozoospermic (n = 77) which served as the control; group 2: asthenozoospermic (n = 36); group 3: teratozoospermic (n = 19) and group 4: teratoasthenozoospermic (n = 19). Semen analysis was done according to the WHO guidelines. SOD and catalase were measured in spermatozoa and seminal plasma by colorimetric method at 347 and 400 nm respectively. One unit of SOD was defined as the amount of enzyme needed to inhibit 50% dismutation of superoxide radical. Units of SOD for spermatozoa and seminal plasma were U/g of protein. Catalase activity was measured by the rate of hydrogen peroxide consumption. One unit of catalase for spermatozoa and seminal plasma was cat/g of protein. The concentration of the protein in the sample was determined by microbiuret method.

Results: SOD and catalase activities in the 4 groups are shown in the Table.

Conclusions: SOD levels are increased in both sperm and seminal plasma of astheno-, terato- and teratoasthenozoospermic men. However, the catalase levels are significantly reduced in both spermatozoa and in seminal plasma of these men. Our results indicate that oxidative stress negatively affects semen quality. Increase in SOD activity is related to poor semen parameters. Both SOD and catalase may have different mechanisms involved in modulating oxidative stress induced damage in these infertile men.

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