Regular coke is related to increased sperm motility and antioxidant levels in infertile men

Author Block: F. F. Pasqualotto, S. Gupta, M. Garcez, A. Agarwal, E. B. Pasqualotto, E. Borges; Universidade de Caxias do Sul, Caxias do Sul, Brazil, Cleveland Clinic, Cleveland, OH

Objective: There are literature reports that increased generation of ROS is linked to abnormal sperm function. The polyunsaturated fatty acids present in the sperm membrane are the main target of the excessive ROS, causing lipid peroxidation of the sperm membrane. In order to counteract the effects of ROS, sperm and seminal plasma possess a number of antioxidant systems that scavenge ROS to prevent internal cellular damage. Superoxide dismutase (SOD) and catalase are important antioxidant enzymes that can quench excess free radicals such as: superoxide anion and hydrogen peroxide respectively. Regular coke is one of the most widely consumed beverages in the world. The objective of our study was to evaluate and correlate the seminal antioxidant enzymatic activity (SOD and catalase levels) among fertile and infertile men with the amount of regular coke ingested/day.

Design: Case control study

Materials and Methods: The study was approved by Institutional Review Board and the patients involved granted their informed consent. Twenty-one fertile donors who had no habit of regularly drinking coke and 94 infertile patients were included in the study. Patients were asked about the amount (mL) of regular coke they drink daily. 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 sperm concentration, percent motility, and morphology according to WHO criteria. Superoxide dismutase and catalase levels were determined with a spectrophotometer. 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: Comparing fertile to infertile men, significantly lower levels of SOD (15.7 ± 4.27 and 41.03 ± 7.5; P = 0.01) and catalase (13.21 ± 3.52 and 36.03 ± 5.36; P = 0.02) were seen in infertile patients compared to fertile donors. A significant correlation between catalase and SOD was observed (r = 0.316, P = 0.001). Sperm morphology by Tygerberg criteria was significantly correlated with the levels of SOD (r = 0.431, P = 0.001) and catalase (r = 0.367, P = 0.001). Catalase levels were also correlated with sperm motility (r = 0.276, P = 0.03). Regular coke intake was correlated with SOD levels (r = 0.208, P = 0.04), but not with catalase levels (r = 0.113, P = 0.09). Patients who drank more than 200-300 mL of regular coke/day had higher SOD (19.1 ± 4.8) compared to men who did not drink coke (12.9 ± 3.8; P = 0.048).

Conclusion: Regular coke ingestion was found to correlate with elevated levels of the antioxidant enzyme SOD. The SOD levels did not correlate with sperm motility. The findings of this case controlled study are in contrast to earlier reports of enhanced sperm motility associated with regular coke intake. Even though the regular coke intake had a good correlation with the levels of SOD, there were no
correlations between sperm motility and SOD levels. Further studies including more patients should be
done to evaluate the role of regular coke in sperm motility.
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