Objective: The controlled generation of reactive oxygen species (ROS) in spermatozoa is associated with normal physiological functions. Uncontrolled and excessive production of ROS however, appears to have a significant role as one of the major factors leading to an infertile status. Superoxide dismutase (SOD) and catalase are important antioxidant enzymes that can quench excessive free radicals such as: superoxide anion and hydrogen peroxide respectively. One of the most commonly used beverages in South America, especially in countries such as Argentine, Uruguay, Paraguay and South of Brazil is called “Mate” or “Chimarrão”. It is based on the herb named “Ilex Paraguariensis” which contains caffeine. The objective of our study was to evaluate and compare the seminal antioxidant enzymatic activity (SOD and Catalase levels) among fertile and infertile men who consume “Mate”.

Design: Case control study

Materials and Methods: The study was approved by the Institutional Review Board and the patients provide their informed consent. The study included twenty-one fertile donors who did not consume “Mate” regularly and 112 infertile patients, who regularly consumed “Mate”. Patients were asked about the amount (mL) of “Mate” 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 for viscosity (normal, moderate, high), 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 consumed.

Results: Compared to fertile donors the infertile men had significantly lower levels of SOD (13.2 ± 5.3 and 41.03 ± 7.5; P = 0.01) and catalase (14.11 ± 5.4 and 36.03 ± 5.36; P = 0.02). 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 = 0.457, P = 0.001) and catalase (r = 0.393, P = 0.001). Sperm motility was correlated with Catalase (r = 0.276, P = 0.03). “Mate” intake was correlated with SOD levels (r = 0.268, P = 0.04), and Catalase levels (r = 0.311, P = 0.01). Patients who drank more than 300 mL of “Mate” per day had higher SOD (15.6 ± 3.8) and Catalase (16.1 ± 2.1) compared to men who did not drink ‘Mate” (SOD = 11.4 ± 3.8; P = 0.042) (Catalase = 12.1 ± 2.5; P = 0.037).

Conclusion: Consumption of the herbal beverage “Mate” was correlated with improved sperm motility and morphology in patients evaluated for infertility. This improvement in semen parameters appears to be mediated by increased seminal antioxidant activity in these men.
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