OXIDATIVE STRESS PARAMETERS AND MELATONIN IN SEMINAL PLASMA OF INFERTILE MEN

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Oxidative stress is regarded as one of the potential cause of male infertility. In 30-80% of infertile men, a high concentration of reactive oxygen species (ROS) in ejaculate was detected. Because melatonin, an indolamine secreted by the pineal gland, is known as a powerful free-radical scavenger and wide-spectrum antioxidant, the aim of the study was to correlate markers of the total antioxidants capacity (TAC) and of oxidative protein damage (advanced oxidation protein products, AOPPs) with melatonin levels in the seminal plasma of men with azoospermia (n=37), theratozoospermia (n=29) and fertile controls (normozoospermia, n=37).

The TAC efficiency was determined from the reduction of excessive free radicals by the FRAP (ferric reducing antioxidative power) spectrophotometric method, and spectrophotometric estimation of AOPP was done. Melatonin concentration was measured by a radioimmunoassay.

The concentration of AOPP and melatonin significantly differed in azoospermic (273.9±123.7 μmol/l and 14.3±9.1 ng/l, respectively; p<0.0001) and theratozoospermic (195.4±91.1 μmol/l and 14.5±7.1 ng/l, respectively; p<0.0001) patients versus fertile men (83.1±93.6 μmol/l and 23.7±10.9 ng/l, respectively), and correlated negatively (r=-0.33, p=0.0016). The TAC levels were significantly higher in azoospermia (2913±900 μmol/l) than in the theratozoospermia (2269±570 μmol/l; p=0.0022) and control group (2120±400 μmol/l; p=0.00016). In azoospermia, also the AOPP concentration was significantly higher than that observed in theratozoospermia (273.9±123.7 μmol/l and 195.4±91.1 μmol/l, respectively; p=0.00029).

High AOPP together with decreased melatonin levels alter the oxidative/antioxidative balance in the ejaculate thereby reducing fertility. Therefore, AOPP and melatonin levels may serve as additional diagnostic markers of semen quality and male reproductive potential.

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