RELATIONSHIP BETWEEN REACTIVE OXYGEN SPECIES AND SPERM VIABILITY IN INFERTILE PATIENTS.

Although reactive oxygen species (ROS) has an important role on sperm physiologic functions, high levels of ROS can overwhelm the antioxidant capacity of the seminal plasma and disrupt sperm function by inducing peroxidative damage to the sperm plasma membrane and DNA. The hypoosmotic swelling (HOS) test assesses sperm viability and is an indicator of membrane integrity. It is based on the ability of live spermatozoa to withstand moderate hypoosmotic stress. The purpose of our study was to compare the levels of ROS with sperm parameters and sperm viability as assessed by the HOS test in infertile men. Semen specimens from 238 men attending our infertility clinic between 1997 to 1998 were examined for sperm concentration, sperm motility and morphology according to the WHO criteria and for sperm viability with the HOS test. ROS production was measured by the chemiluminescence assay. The results were expressed as [Log (ROS + 1) X 10^4 counted photons/minute/20 X 10^6 sperm]. ROS levels were negatively related to sperm concentration (r = -0.36; P = 0.0001), sperm motility (r = -0.14; P = 0.02), and sperm morphology (r = -0.27; P = 0.0001). Also, sperm viability was inversely correlated with ROS levels (r = -0.14; P = 0.03), demonstrating that higher ROS levels in infertile men leads to lower sperm viability. In conclusion, poor sperm viability is associated with higher levels of ROS in infertile men. Treatment of these patients should include strategies to reduce seminal oxidative stress. [Supported by a research grant from the Cleveland Clinic Foundation.]