ROLE OF LEUKOCYTOSPERMIA IN OXIDATIVE STRESS
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Leukocytes are the main producers of reactive oxygen species (ROS) in the
seminal ejaculate. Controversy exists regarding their pathological levels. The
current diagnosis of leukocytospermia is based on the upper limit of greater than 1
X 10^6/mL recommended by the WHO. Higher levels of ROS can result in
oxidative stress and impair sperm function. The aim of this study was to
investigate 1) the relationship between the presence of white blood cells as
measured by the Endtz test and oxidative stress, and 2) to use ROS and total
antioxidant capacity (TAC) as predictive measure in determining a cut-off value
for Endtz. ROS and TAC levels were examined in 288 subfertile men. Patients
were divided into two groups. Group I consisted of 263 subfertile patients
without leukocytospermia; Group II consisted of 25 patients who presented with
leukocytospermia. Leukocytospermia was evaluated by the Endtz
(myeloperoxidase) staining test. ROS levels were measured by
chemiluminescence assay, and TAC by the enhanced chemiluminescence assay.
In all patients, ROS levels showed significant correlation with sperm
concentration (r = -0.36, p < 0.001), and motility (r = -0.14, p = 0.01). In the
absence of leukocytospermia, ROS significantly correlated with sperm
concentration, and motility (p = 0.01). Endtz was correlated with ROS (p < 0.05),
TAC (p < 0.05), and the ROS-TAC score (p < 0.001). Endtz positive and
negative samples differed significantly for ROS (p <0.01), TAC (p <0.01), and
ROS-TAC scores (p <0.01). As a predictive measure of leukocytospermia, a
ROS-TAC score proved to be significant with 84.8% area under the receiver
operator characteristics (p <0.01). Significantly higher levels of ROS was
produced in semen specimens of patients in all groups with Endtz value of >0 X
10^6/mL (from >0 to 0.4 to >2X 10^6WBC/mL) compared to those with Endtz equal
to 0 X 10^6/mL (P<0.02). The incidence of leukocytospermia was seen in less than
10% of the total subfertile population. In conclusion, oxidative stress can occur
even in the absence of leukocytospermia. Therefore, complete removal of
seminal white blood cells by sperm preparation techniques is important to
minimize the harmful effects of ROS.