

Leukocytospermia and its Correlation with Sperm Parameters in Male Infertility

Hassani Bafrani, Hassan* (Ph.D.)¹; Shahaboddin, Mohamad Esmail (M.Sc.)²

1. Department of Anatomy and Embryology, Faculty of Medicine, Kashan University of Medical Sciences, Kashan, Iran.

2. Department of Biochemistry, Faculty of Medicine, Kashan University of Medical Sciences, Kashan, Iran.

Abstract

Introduction: Reactive oxygen species (ROS) in the seminal fluid are derived from abnormal sperm, white blood cells or both. Oxidative stress will cause lipid peroxidation, decreased sperm motility and abnormalities in sperm fertilizing capacity. The aims of this study were to compare sperm parameters (Sperm count, motility and morphology) in infertile men with or without leukocytospermia and to measure both seminal total antioxidant capacity (TAC) and malondialdehyde (MDA) concentration.

Materials and Methods: This case-control study included 110 male subjects referring to Kashan Infertility Center during 2007-2008. Regarding the World Health Organization criteria and following sperm analysis and seminal leukocyte counts, the cases were divided into two leukocytospermic and non-leukocytospermic groups and a third group composed of 45 men with normal test results were selected as the controls. Seminal plasma MDA and TAC levels were spectrophotometrically measured.

Results: Upon semen analyses of 110 subjects, 45 individuals were classified as healthy, 30 as leukocytospermic and 35 as non-leukocytospermic; although there were $<0.25 \times 10^6$ leukocytes in the semen of the latter group. Sperm motility (a+b) had a significant difference in the leukocytospermic individuals compared to non-leukocytospermic or healthy subjects ($p < 0.05$ and $p < 0.001$, respectively). MDA levels in the leukocytospermic group ($178 \pm 18.48 \mu\text{mol/L}$) were higher than those of the non-leukocytospermic ($2.7 \pm 1.73 \mu\text{mol/L}$) and the control group ($0.4 \pm 0.14 \mu\text{mol/L}$). Additionally, TAC levels in the leukocytospermic group ($636 \pm 75.58 \mu\text{mol/L}$) were significantly lower than the non-leukocytospermic ($986 \pm 105.56 \mu\text{mol/L}$) or the controls ($989 \pm 95.95 \mu\text{mol/L}$), ($p < 0.0001$).

Conclusions: High counts of leukocytes in the seminal fluid results in the increased production of ROS and their stable byproducts (MDA) in semen with subsequent depletion of its antioxidant capacity. Decreased TAC and increased MDA levels influence sperm parameters, especially its motility. Regarding the direct effects of sperm parameters on sperm fertilizing capacity, it is concluded that leukocytospermia may deleteriously influence male fertility.

Key Words: Leukocytospermia, Lipid peroxidation, Male infertility, Oxidative stress, Reactive oxygen
Semen analysis, species, Sperm parameters.

Corresponding Author: Hassan Hassani Bafrani, Department of Anatomy, Faculty of Medicine, Kashan University of Medical Sciences, Kashan, Iran.

E-mail: hhassani@kaums.ac.ir

Received: Dec 7, 2008; **Accepted:** Jan 12, 2009