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Male Genital Tract Inflammation: The Role of Selected Interleukins in Regulation of Pro-Oxidant and Antioxidant Enzymatic Substances in Seminal Plasma

DOROTA SANOCKA*, PIOTR JĘDRZEJCZAK†, ANNA SZUMAŁA-KAŹKOL†, MONIKA FRĄCZEK* AND MACIEJ KURPISZ*

*From the * Institute of Human Genetics, Polish Academy of Sciences, Poznań, Poland; and† Clinic of Infertility and Reproductive Endocrinology, School of Medicine, Poznań, Poland.*

Correspondence to: Prof Maciej Kurpisz, Institute of Human Genetics, Polish Academy of Sciences, Strzeszyńska 32, Poznań, Poland (e-mail: kurpimac{at}man.poznan.pl)

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Human semen contains spermatozoa as well as populations of round nonspermatozoal cells primarily consisting of leukocytes. Activation of white blood cells present in the seminal plasma during genital tract inflammation and cellular reactions against microbial agents may provoke a release of a variety of products such as cytokines and reactive oxygen species. The aim of this study was to evaluate whether a panel of selected cytokines (interleukin [IL]-1ß, IL-6, IL-8, and tumor necrosis factor-α [TNFα]) detectable in seminal plasma during male genital tract inflammation could be considered as mediators between altered semen parameters and changed levels of pro-oxidant and antioxidant substances. Studies using chemiluminometric, spectrophotometric, and enzyme-linked immunosorbent assay methods indicate that proinflammatory cytokines such as IL-1ß, IL-6, IL-8, and TNFα may modulate pro-oxidant and antioxidant activities in the male genital tract. The data also suggest that the function of pro-oxidant and antioxidant systems in semen may directly influence basic semen parameters. The elevated numbers of leukocytes present in semen during male genital tract inflammation without an associated contribution of cytokines and semen antioxidant capacity appear to be of little prognostic value in evaluating male fertilization potential.

Key words: Semen, leukocytes, reactive oxygen species, infertility, cytokines

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