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# Inflammatory Cytokine Concentrations Are Elevated in Seminal Plasma of Men With Spinal Cord Injuries

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The semen of most men with spinal cord injury (SCI) contains sperm with abnormally low motility. Studies suggest that the seminal plasma is the source of this condition. The seminal plasma of men with SCI contains an abnormally high number of white blood cells (WBC), specifically, activated T cells. It is known that activated T cells secrete cytokines and elevated concentrations of cytokines can be harmful to sperm. It is not known if the seminal plasma of men with SCI contains elevated concentrations of cytokines. The purpose of this study was to determine if the seminal plasma of men with SCI contained elevated concentrations of cytokines. Using the method of enzyme-linked immunosorbant assay (ELISA), ten cytokines were measured in the seminal plasma of men with SCI as well as healthy non-SCI control subjects. The cytokines of interest were grouped according to Th1 effector functions: interleukin 1 beta, interleukin 2, interleukin 12, tumor necrosis factor alpha, tumor necrosis factor beta, interferon gamma (IL1 $\beta$ , IL2, IL12, TNF $\alpha$ , TNF $\beta$ , INF $\gamma$ , respectively) and Th2 effector functions: interleukin 4, interleukin 6, interleukin 10, transforming growth factor beta 1 (IL4, IL6, IL10, TGF $\beta$ 1, respectively). The results showed a predominance of Th1 versus Th2 cytokine production in the seminal plasma of men with SCI compared with that of control subjects. This finding suggests an immunologic basis for infertility as a possible avenue of investigation in these men.

Key words: Sperm, infertility, semen, T cells, Th1, Th2

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