RELATIONSHIP BETWEEN SEMEN CHARACTERISTICS, OXIDATIVE STRESS AND IL-6 LEVELS IN INFERTILE PATIENTS

Fabio F. Pasqualotto*, Caxias do Sul, OH, Brazil; Rakesh K. Sharma, Cleveland, OH; Hiroshi Kobayashi, Cleveland, OH; Anthony J. Thomas, Cleveland, OH; Ashok Agarwal, Cleveland, OH

Introduction and Objective: Oxidative stress, as a result of elevated levels of reactive oxygen species (ROS) and depressed levels of antioxidants is associated with male infertility. Increased levels of cytokines are also reported in the seminal plasma of infertile men. We assessed semen characteristics, levels of ROS, non-enzymatic total antioxidant capacity (TAC), a composite ROS-TAC score, and interleukin-6 (IL-6) in infertile patients with varicocele and fertile and infertile patients after a vasectomy reversal procedure and compared them to normal healthy men.

Methods: Semen specimens were obtained from 63 men who underwent infertility evaluation and 16 normal donors. Of these 63 men, 24 underwent a previous vasectomy reversal and 39 had varicocele. Vasectomy reversal patients were further divided into fertile (n = 11) and infertile (n = 13) group. ROS and TAC were measured by the chemiluminescence assay. A composite ROS-TAC score was generated. IL-6 concentration was measured by the enzyme-linked immunoassay.

Results: Levels of ROS (mean log ROS (X 10^4 cpm) were significantly increased in overall vasectomy reversal patients (1.84 ± 0.29 for the fertile reversal patients, 2.46 ± 0.28 for the infertile reversal patients; p = 0.001) and varicocele patients (1.95 ± 0.18; p = 0.04) compared to donors (1.25 ± 0.20). TAC levels were comparable between donors (1,523.3 ± 162.6) and the infertile reversal patients (1,497.9 ± 205.1; p = 0.65) and between donors and varicocele patients (1,175.3 ± 89; p = 0.06). ROS-TAC score was significantly lower in patients with varicocele (40.2 ± 2.5) compared to donors (50 ± 4.6; p = 0.007). Significantly elevated IL-6 (log values) were seen in both fertile (1.89 ± 0.29; p = 0.03) and infertile vasectomy reversal groups (1.76 ± 0.25; p = 0.04), as well as varicocele patients (1.86 ± 0.15; p = 0.03) compared to donors (0.83 ± 0.27). IL-6 levels were directly correlated with ROS in all groups (r = 0.39; p = 0.001). IL-6 levels were negatively related to sperm motility in all groups evaluated (r = - 0.32; p = 0.008).

Conclusions: Infertile men following vasectomy reversal and patients with varicocele have higher levels of oxidative stress as indicated by elevated ROS and IL-6 levels. Oxidative stress and the pro-inflammatory cytokine IL-6 may contribute to the pathophysiology of the infertility in varicocele patients and following vasectomy reversal.

Source of Funding: None

Disclosures (by author):
Fabio F Pasqualotto - No Disclosure Necessary
Rakesh K Sharma - No Disclosure Necessary
Hiroshi Kobayashi - No Disclosure Necessary
Anthony J Thomas - No Disclosure Necessary
Ashok Agarwal - No Disclosure Necessary