LEUKOCYTE-INDUCED REACTIVE OXYGEN SPECIES (ROS) PRODUCTION IN SPERM FROM LEUKOCYTOSPERMIC SAMPLES.
R.A. Şaleh¹, R.K. Sharma¹, E. Kandirali¹*, J.G. Alyarez², E.A. Nada³, M.H. El-Tonsy⁴*, D.R. Nelson¹, M. Ollero², A.J. Thomas Jr.*, and A. Agarwal¹*, Urological Institute, Cleveland Clinic Foundation, Cleveland, OH; ²Dept. Ob/Gyn, Harvard Medical School, Boston, MA; ³Sohag Faculty of Medicine, Sohag, Egypt; ⁴al-Minya Faculty of Medicine, al-Minya, Egypt.

There is much debate as to whether the origin of ROS in semen is from sperm, seminal leukocytes, or both. The objective of this study was to investigate the role of seminal leukocytes in enhancing ROS production by sperm. Semen specimens were obtained from 48 patients [leukocytospermic (n = 16), non-leukocytospermic (n = 32)] and 13 normal donors. Levels of ROS were determined in pure sperm suspensions (removal of leukocytes by Dynabeads) and after phorbol 12-myristate 13-acetate (PMA) stimulation. Results were expressed as counted photons per minute/20 X 10⁶ sperm/mL. ROS levels (median 25% and 75%) in pure sperm suspensions were significantly higher in the leukocytospermic group [3.2 (0.65 to 6.8)] compared to the non-leukocytospermic group [0.31 (0.09 to 1.2)] (P = 0.002), and the donors [0.06 (0.01 to 0.2)] (P = 0.001). PMA induced ROS levels were significantly higher in the leukocytospermic group, 9.2 (2 - 373.7), compared to non-leukocytospermic group, 0.94 (0.3 - 2) (P = 0.0003), and donor group, 0.1 (0.03 - 0.1) (P = 0.0002). A positive correlation was found between seminal leukocytic counts and ROS levels in pure sperm suspension (r = 0.54, P <0.0001) and after PMA stimulation (r = 0.56, P <0.0001). Our results demonstrate a strong correlation between leukocytospermia and increased potential for ROS production by sperm. In conclusion, the contribution of leukocytes to ROS production in semen appears to include not only the direct release of ROS by these cells, but also the release of ROS by leukocyte-stimulated sperm. Such stimulation may be via direct contact or mediated by soluble products released by the leukocytes.