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FLOW CYTOMETRIC ANALYSIS OF THE INTEGRITY OF SPERM DNA AND INTRACELLULAR LEVELS OF HYDROGEN PEROXIDE AND SUPEROXIDE ANION IN HUMAN SPERMATOZOA OF INFERTILE AND POTENTIALLY FERTILE MEN

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The aim of the study was to examine correlation between sperm integrity and intercellular levels of hydrogen peroxide (H$_2$O$_2$) and superoxide anion (O$_2^-$) in infertile and potentially fertile men.

Materials and Methods. 17 healthy human volunteers aged from 25 to 49 were examined. The semen analysis was performed according to the 5th edition of WHO guidelines from 2010. The sperm morphology is defined by the strict Kruger’s criteria. The Sperm DNA integrity (DFI) was determined by flow cytometry – Sperm DNA Integrity Test (SDI). Intercellular levels of H$_2$O$_2$ and O$_2^-$ were also evaluated by this method. Minimum 10 000 labeled sperm cells with sperm speed less than 100 cells per second were analyzed for each sample. The obtained data was processed with statistical package SPSS19 (IBM Corporation). Patients were divided into two groups: First group (control): potentially fertile men with. Second group (patients): infertile men. The comparison of the observed parameters between controls and patients was executed with non-parametric analysis because of inhomogeneous distribution of the data.

Results. Mean age of the control group (n=8) was 33.38 years (±2.17) and of the patient groups (n=9) is 35.67 years (±2.27). There is no statistically significant dependence of the age and days of abstinence between two groups. The analysis of the results discovered positive correlation between age of the patients and percentage of DFI (P<0.027). Also positive correlations between intercellular levels of superoxide anion (O$_2^-$) and percentage of DFI (P<0.001) and HDFI (P<0.006) were defined. Significantly higher levels of O$_2^-$ and DFI (P<0.05) were detected in the group of infertile volunteers. No correlations were found between levels of hydrogen peroxide (H$_2$O$_2$) and other cited parameters.

The obtained results confirm the observations of other researchers of the negative impact of the oxidative stress on the sperm fertility. Currently there is a lack of consensus when it comes to measuring the free radicals and antioxidative capacity, including a total antioxidative capacity, as part of the routine evaluation of the male factor. The reason for this is that there are no standard analytical methods.

Research shows that the flow cytometric analysis is a suitable evaluation method for assessment of sperm indicators and sperm cells, because apoptotic cells can be easily differentiated. This is an important advantage, since it becomes clear that the free radical levels are higher in apoptosis.

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ASSOCIATIONS OF VASCULAR ENDOTHELIAL GROWTH FACTOR-A WITH CARDIAC REMODELING IN PATIENTS AFTER ST-ELEVATION MYOCARDIAL INFARCTION

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Vascular endothelial growth factor A (VEGF-A) influences positively on ischemic tissue revascularization with the help of endothelial cell proliferation, neovascularization of ischemic tissue, vessel permeability increase, coronary collaterals development which all protects cardiomyocytes from injury and pathological remodeling. The aim of research was to investigate associations between VEGF-A level and left ventricular remodeling after STEMI.

Material and Methods. 62 patients with STEMI, 51 (82.3%) male and 11 (17.7%) female at average age 58.63±8.90 years were enrolled to the study since 2016 till 2017. Control group consisted of 20 healthy subjects.