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Collection of abstracts "**Biological Markers in Fundamental and Clinical Medicine**" (*official specialized scientific journal of The Czech Republic, registration number MK CR E 22955*) by the publishing center of The ESCBM provides its lanes for information materials in the field of scientific research of modern biological markers in clinical and experimental medicine, pharmacy, and fundamental biology. The collection publishes abstracts of scientific and practical conferences, seminars, symposia, dedicated to the study of molecular-biochemical and functional markers, playing a role in pathogenesis, diagnosis, prognosis, as well as assessing the monitoring of the treatment effectiveness for the various systems and organs diseases. **Among the priority topics of the journal there is the research of molecular mechanisms of diseases pathogenesis, the study of the structure and functions of peptides, nucleic acids, nucleotides, lipids and other biologically active components of body cells.**

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chemiluminescence in the group of colorectal cancer patients were decreased compared with healthy people more than in group of stomach cancer patients.

Well-known chemiluminescence activators (luminol and Fe³⁺) are of little use for identifying the tumor location, since they lead to equalization in the run-off by a maximum of the intensities of the serum samples of patients with different tumor. In this connection, it is necessary to search for specific agents to enhance differences in induced chemiluminescence. The analysis of predictive and diagnostic value of the intensity of serum chemiluminescence for cancer requires further study.

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Key words. Chemiluminescence, Fe³⁺-induced chemiluminescence, serum, cancer.

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METALLOTHIONEINS PROTECT AGAINST OBESE-INDUCED OXIDATIVE STRESS IN YOUNG WOMEN

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Obesity is rapidly increasing all over the world and pretends to be the global medical and social problem. Frequency of persons with overweight and obesity in the world has doubled since 1980, and by 2016, more than 1.9 billion adults with overweight and over 650 million with obesity, the main part of which belongs to young people (<http://www.who.int/mediacentre/factsheets/fs311/en/>). Because the oxidative stress is the main cause of progress of different pathologies and not too much is known about this phenomena under obesity, we were inspired to study the parameters of oxidative stress, concentration of multifunctional stress-related and metal-binding proteins metallothioneins and the level of molecular lesions in the blood of obese women (32 < body mass index < 37).

Materials and Methods. About 15 women from each of two groups (control (C) and obesity (O)) were screened. Oxidative stress response was determined from superoxide dismutase, catalase and glutathione-S-transferase

activities, total glutathione, concentration of TBA-reactive substance (TBARS), protein carbonyls and oxyradical formation. Metallothioneins concentration as a quantity of thiol groups (MT-SH) was evaluated. Molecular markers of toxicity (DNA strand breaks, cholinesterase activity, lactate dehydrogenase) were assayed. The set of biomarkers of stress and toxicity was applied due to the guidelines. The low density (LDL) and high density (HDL) lipoproteins, glycated hemoglobin (HbA1c), total cholesterol and triglycerides were also measured.

In obese patients, the concentration of total cholesterol (by 29%) and lower density lipoproteins (LDL, by 59%) is higher, while the high-density lipoproteins (HDL, by 19%) is lower than in the control group. The ratio of HDL/LDL in the control group is 0.82 and decreases for obesity to 0.44. Parameters of lipid metabolism correlate with BMI ($r > |0.73|$, $p < 0.001$). The concentration of triglycerides and glycosylated hemoglobin is similar in both groups of patients.

The lower activity of superoxide dismutase, the higher activity of catalase and the level of oxyradicals formation in the obese patients (O-group) were shown compared to the control group which persons had no appropriate pathology (C-group). The investigated O-group was characterized by the lower concentration of glutathione and the higher concentration of metallothioneins. In obese patients, oxidative stress (Integral index of oxidative stress = - 0.43), as well as signs of geno- and neurotoxicity were manifested by increasing the DNA fragmentations and cholinesterase activity respectively. The correlation between the concentration of metallothioneins and oxidative stress indices in the regression model was existed: $MT-SH = 0.027 \times OR + 0.41 \times CAT - 0.55 \times SOD^*$, $R^2 = 0.92$; $F(3,12) = 57.8$, $p < 0.001$.

Results. The use of the principal component analysis with the NIPALS algorithm allowed to find correlations between investigated parameters of the examined normal-weight and obese individuals. Metallothioneins form a joint cluster with parameters of oxidative stress, cytotoxicity, index of body mass, total cholesterol, and low density lipoprotein. These indices are also crucial in the development of obesity, as they correlate with O-group with a high significance. The control group is located in opposition to the O-group and includes indices of reduced glutathione and high density lipoprotein. This arrangement proves the relation of the patterns within the cluster and their opposite nature between the two clusters. To sum up, the integrated analysis of the selected parameters of lipids' metabolism and oxidative stress, metallothioneins and signs of cytotoxicity in obese young women allowed to determine the amount of features that deepens pathological changes. It is the discrepancy in oxidative-reductive status related to simultaneously activation of catalase and manifestation of oxidative injury, the redox-equilibrium shift in the direction of the prooxidant processes and the disturbance of the balance of anaerobic / aerobic glycolysis and $NAD^+/NADH$, reducing the portion of high-density lipoproteins to low-density lipoproteins, as well as increasing the DNA fragmentation. Metallothioneins have a partial tread effect on radical processes and reduce manifestations of oxidative damage to biomolecules in obese patients. Comparatively the same capacity of metallothioneins we have shown before for human thyroid nodular goiter and ovarian cancer model (Falfushynska et al., 2014, 2015). In this way metallothioneins should be deeply studied as a putative supplier for obese patients in a reason of oxidative injury consequences relieve.

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Key words: obesity, oxidative stress, lipoproteins, metallothioneins, cytotoxicity

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VITAMIN D: A POTENTIAL BIOMARKER FOR MORE AGGRESSIVE PROSTATE CANCER

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One of the many functions of vitamin D is associated with its antiproliferative and proapoptotic effects on prostate cancer cells. One of the debatable questions nowadays is whether vitamin D deficiency can lead to an increased risk of prostate cancer. Recent studies have shown that low serum vitamin D levels may be associated with worse prognosis in cancer patients. It could be assumed that vitamin D may serve as an important biomarker of prostate cancer aggressiveness. However, levels of vitamin D are not routinely measured in daily clinical practice. In Bulgaria more complex and multi-faceted studies on vitamin D status and its relationships with clinical determinants in prostate cancer have not been conducted. The aim of the present study was to perform a comparative analysis of vitamin D status in prostate cancer patients with different aggressiveness and to assess the relationship with clinical and biochemical parameters characterizing the disease.

Materials and Methods. This prospective study included 88 men with histologically proven prostate cancer (52 - 85 years) attending the Urology Clinic at University Hospital - Varna in the period January-December 2015. The