With severe CGP in patients after 12 months, after surgery, a favorable change in bone metabolism was observed in the oral cavity: compared with the outcome of OPG increased by 74.4% (p<0.05), limiting the concentration of sRANKL by 37.1% (p<0.05), the activity of CAF increased by 46.3% (p<0.05) (Table 2). In patients after sinus lifting and dental implantation, statistically significant differences (p<0.05) occurred only as an increase in bone alkaline phosphatase.

Conclusion. Detection of osteomarkers in the oral fluid informatively reflects the degree of bone remodeling after surgical treatment of severe CGP. For dynamic observation of patients after sinus lifting and dental implantation, the definition of osteomediators in the oral fluid is not very informative.

References
1. Balashov A.S., Kalinkin M.N. Markers of bone metabolism during pathological root resorption. PhD student. 2015; 72 (5): 9-13.
2. Kushlinsky N.E., Gershtein E.S., Soloviev Yu.N., Timofeev Yu.S., Babkina I.V., Dolinkin A.O., Zuev A.A., Kostyleva O.I. The receptor-activator of nuclear transcription factor NF-kB (RANK), its ligand RANKL and natural blocker RANKL osteoprotegerin (OPG) in the serum of patients with primary bone tumors. Bulletin of experimental biology and medicine. 2017; 163 (4): 476-480.
3. Ahamed S.L., Nalini E.H., Kumar A.P., Devi R.R. Salivary Biomarkers of Periodontal Disease- the Ultimate Diagnostic. Int J Recent Sci Res. 2018; 9(4): 25927-25932.

Key words: osteoprotegerin, ligand of a soluble activator of the nucleation factor kappa B, alkaline phosphatase, oral fluid, osteormodeling

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SUPERWEAK LUMINESCENCE AS A MARKER OF DETECTION OF COLON CANCER

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Chemiluminescence (CL) is the emission of light waves accompanying chemical reactions. A necessary condition for all types of chemiluminescence is a chemical oxidation reaction. Spontaneous CL includes three main types:

- superweak luminescence (SWL) is the glow of living organisms, tissues, cells, their homogenates and some biosubstrates in the visible and infrared specter of light (360-800 nm) [1, 2],
- bioluminescence is the glow in the visible specter of light (420-710 nm), inherent in many organisms (bacteria, fireflies, some fish, fungi and protozoa). In all cases, bioluminescence is the result of enzymatic oxidation of special substances – luciferins [3, 4],
- mitogeneticluminescenceis the glow in ultraviolet specter of light (190-320 nm), which is observed during cell division [5].

CL is one of the main methods for studying the reactions of chain lipid peroxidation in biological membranes and plasma lipoproteins. The aim of this study is to analyze of spontaneous chemiluminescence in biological samples of patients with colon cancer.

Materials and Methods. The object of the study was normal colon mucosal tissue, colon cancer tissue and blood serum of patients. Biological material of four patients from “Mogilev Regional Oncology Dispensary” were analyzed with the following tumors: sigmoid cancer (T3N0M0), rectosigmoid cancer (T3N1M0), rectosigmoid cancer with peritoneum metastases (T3N0M1) and cecum carcinoma (T3N0M0). We used Tissue Lyser LT homogenizer (Germany) to homogenize tissue. The method
of homogenization was wet (with buffer). Spontaneous luminescence was detected by spectrofluorimetric analysis (FP-8200 spectrofluorimeter, Japan). Sensitivity was Medium. 1.2 ml of phosphate buffer (pH = 6.86) and 5 μl of homogenization were used to study the chemiluminescence of tissue fragments. To determine the wavelength at which the study was continued, 3D spectra of a phosphate buffer was obtained with homogenized tumor tissue and a phosphate buffer with homogenized normal colon mucosa tissue [4]. Two peaks of SWL of phosphate buffer with homogenized tissue fragments were observed: at a wavelength of 230 nm and 280 nm. To study the serum chemiluminescence of patients, we used 1.2 ml of phosphate buffer (pH = 6.86) and 5 μl of serum. In all serum samples, a peak of SWL was observed only at a wavelength of 280 nm. Databases with the results were formed in MS Excel. Statistical analysis was carried out using the program STATISTICA 10.0 (StatSoft).

**Results.** The SWL intensity of the normal colon mucosa ranged from 473.3 to 1391.1 at a wavelength of 230 nm, the average was 786.7±208.4. At a wavelength of 280 nm, the SWL intensity of the normal colon mucosa varied from 1940.9 to 6795.9, the average was 3562.8±1123.5. The SWL intensity of colon cancer tissue varied from 321.9 to 461.8 at a wavelength of 230 nm, the average was 386.2±31.5. At a wavelength of 280 nm, the SWL intensity of colon cancer tumor varied from 1270.5 to 1871.7, the average was 1574.3 ± 146.7. The SWL intensity of patient's serum ranged from 932.2 to 2025.2 at a wavelength of 280 nm, the average was 1408.4±246.9. We revealed a decrease of serum SWL intensity in compared with SWL intensity of tumor tissue.

A statistically significant differences were evaluated by Manna-Whitney test. A decrease in SWL intensity was detected in the tumor tissue compared to normal colon mucosa both at a wavelength of 230 nm (p <0.03) and at a wavelength of 280 nm (p <0.03). The SWL intensity at a wavelength of 230 nm in the tumor tissue was reduced by 2.03 times, at a wavelength of 280 nm – by 2.26.

Prospects for further research. The future study of the spectrum of SWL in normal colon mucosa and in colon cancer tissue will allow to determine the diagnostic range of SWL intensity for the verification of colon cancer by chemiluminescence.

**References.**

1. Vinnik Yu.S. Clinical use of chemiluminescent analysis / Yu.S. Vinnik, A.A. Savchenko, O.V. Peryanova, O.V. Teplyakova, S.V. Yakimov, E.Yu. Teplyakov, O.S. Meshkova // Siberian Medical Journal (Irkutsk). – 2004. – P. 11-14.

2. Vinnik, Yu.A. The use of chemiluminescent analysis in assessing the structural and functional state of plasma membranes in patients with colorectal cancer / Yu.A. Vinnik, Yu.P. Belevtsov, V.I. Zhukov, O.V. Zaitseva, V.G. Knigavko, A.S. Morzeenko // Novoatvorennya. – 2011. – Т. 3, issue 3. – S. 60-65.

3. Vladimirov, Yu.A. Activated chemiluminescence and bioluminescence as a tool in biomedical research / Yu.A. Vladimirov // Sorov educational journal. – 2001. – №1. – S.16-23.

4. Vladimirov, Yu.A. Free radicals and cell chemiluminescence. / Yu.A. Vladimirov, E.V. Proskurnina // Successes in biological chemistry. – 2009. – T. 49. – S. 341.

5. Lelevich, S.V. Clinical biochemistry: a textbook for students of the specialty 1-79 01 04 “Medical and diagnostic business” / S.V. Lelevich. – Grodno: State Medical University. – 2017. – P. 304.

**Key words.** Chemiluminescence, superweak luminescence, colon cancer.