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THE EFFECT OF PHOTODYNAMIC THERAPY USING CHLORIN SERIES PHOTOSENSITIZERS ON APOPTOSIS OF TUMOR CELLS

Keywords: photodynamic therapy (PDT), photosensitizers, apotosis, cancer cells, laser.

Introduction. There are some methods of reducing the viability of malignant cells after photodynamic therapy (PDT), when cells die as the result of necrosis and apoptosis [2, 4]. At the same time, apoptosis is considered to be the most preferable type of death of malignant cells, since the released factor of apoptotic cells that have passed PDT suppresses the vital activity of malignant cells not only in the main tumor, but also in its metastases.Purpose of the study: Assess the effect of Tumor-Cells Apoptosis Factor (TCApF), induced by PDT from a real human tumor [1]. Measure the stimulation of apoptosis of cells in systematically crossed cancer cell cultures and a decrease in their vital activity.

Materials and methods of study: Patients with malignant tumors were intravenously injected with the photoditazine chlorine-type photosensitizer at the rate of 1.2–1.5 mg / kg of patient weight. After 3 hours, PDT was performed. Laser devices for PDT with wavelength of 662 nm were used as source of laser radiation. The energy density of laser irradiation was 250–300 J / cm^2. An hour after PDT, 0.5 ml of cell exudate (in process of apoptosis) was collected from tumor tissue together with extracellular fluid and applied on the surface of tissue culture flask that contained systematically crossed cancer cell culture. After 60 minutes, using cytological methods (with the calculation of % apoptosis in 1000 cells of a systematically crossed cancer cell culture) the effectiveness of the process of apoptosis was tested [3].

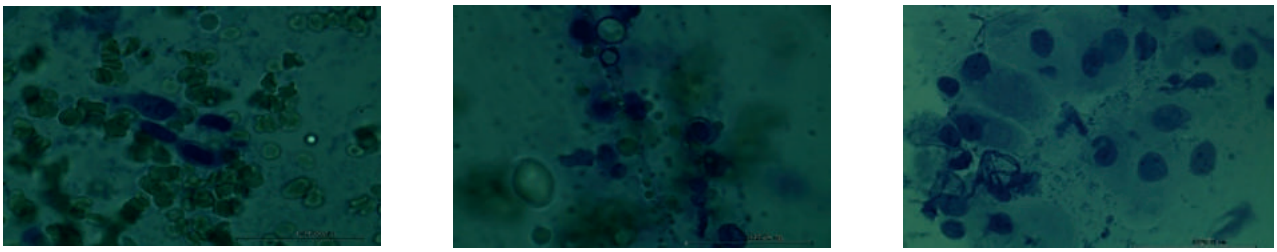
After that, the effect of exudate (from tumor tissue on with PDT was performed) on the cultured cells was evaluated. TCApF was applied to the surface of a monolayer of systematically crossed cancer cell cultures: RD, CCL-136 RH, HEp-2, HeLa, KB (Tab. 1 – the results of the study).

Table 1

Evaluation of the effectiveness of TAF exposure by the number of apoptotic cells in culture

№ п\п	Disease and main tumor	Cell culture	% of cells with apoptosis before TAF	% of cells with apoptosis after TAF
1	Rhabdomyosarcoma	RD, CCL-136	**5,2**	**91,4**
2	Rhabdomyosarcoma	RD, CCL-136	**5,5**	90,7
3	Mammary cancer	HEp-2	**7,8**	88,4
4	Kidney cancer	RH	**8,1**	80,3
5	Cervical cancer	HeLa	**10,7**	95,6
6	Cervical cancer	HeLa	**10,0**	93,8
7	Cervical cancer	HeLa	**11,2**	94,3
8	Skin cancer	KB	**6,3**	82,2
9	Skin cancer	KB	**6,6**	85,7

All cytological preparations showed the start of a tumor apoptosis factor and almost complete suppression of the viability of the tumor cells of the culture (Fig. 1, 2, 3).



Fugure 1. Tumor cells before PDT

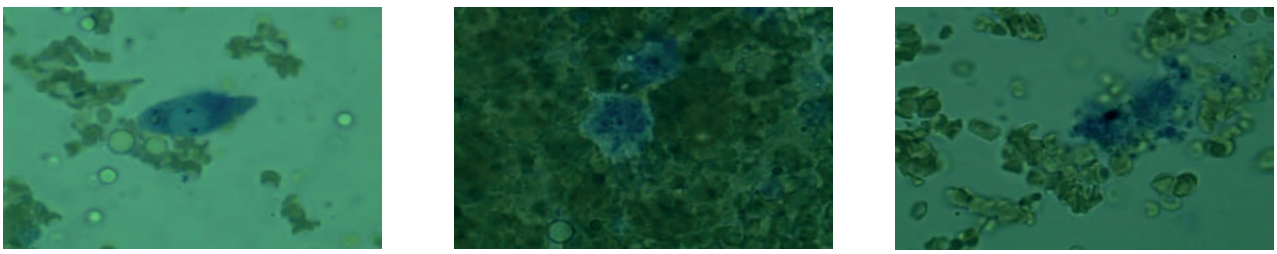


Figure 2. Tumor cells after PDT (tumor cell breakdown)

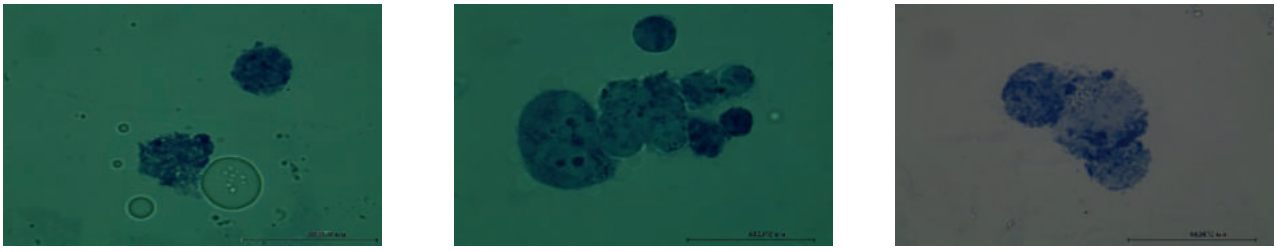


Figure 3. Cell culture of the tumor affected by exudate from a real tumor that was previously exposed to photodynamic therapy (tumor cell breakdown)

Conclusion. Experiments have shown that exudate from a human tumor, affected by PDT, starts the process of apoptosis in most of systematically crossed

cancer cell culture. This information can be helpful in the process of creating new types of "vaccine" against cancer and elimination of metastases.

References

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SYNTHESIS OF ANALOGS OF IMMUNOSTIMULANT PLERIXAFOR VIA DONOR-ACCEPTOR CYCLOPROPANE OPENING WITH *N*-NUCLEOPHILES*

Keywords: chemokine receptor CXCR4, plerixafor, donor–acceptor cyclopropanes, oncoimmunology.

Over the past years, the chemokine receptor CXCR4, a G-protein-coupled receptor that regulates cell migration, has been used as a molecular target for the cancer