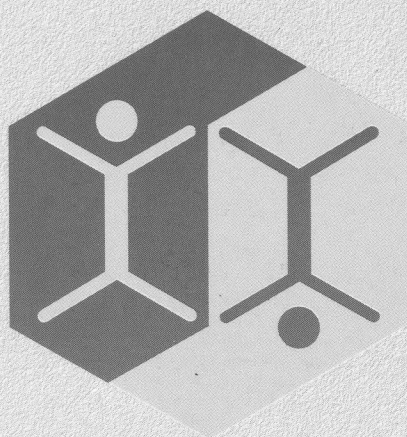


ENVIRONMENT AND HUMAN HEALTH



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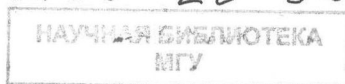
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ROLE OF CYTOKINES AND CELL ADHESION MOLECULES IN PATHOGENESIS OF THE ATHEROSCLEROSIS AT THE PATIENTS WITH ISCHEMIC HEART AND BRAIN DISEASES EXPOSED BY IONIZING RADIATION AFTER THE CHERNOBYL CATASTROPHE

***Kruchinsky N. G., Teplyakov A. I. Akulich N. V.,
Pryschepova E. V., Teplyakova D. V., Chegerova T. I.***

*Research Institute for Ecological and Occupational Diseases, Mogilev,
Belarus*

At various categories of the population, undergone to low-leveled ionizing radiation influence (constantly living, liquidators and evacuated persons) as a result of the Chernobyl Catastrophe (ChC) the augmentation of thrombosis risk connected to shift of hemostasiological (activation of cellular-vessels and coagulation components, braking of anticoagulant and fibrinolytic activity) rheological blood properties is marked [1]. It has allowed us to state the assumption of a key role of infringements of intercellular interactions in initialization of atherogenesis and a clottage at unfavorable influence of low-leveled ionizing radiation influence [2].

The purpose of research was check of a hypothesis that in a pathogenic of an atherosclerosis and its thrombotic complications at patients with ischemic diseases of heart and a brain, undergone to low-leveled radioactive influence, a key role cytokines and play molecules of a cellular adhesion.

Object of research were 29 patients with an atherosclerosis. Among them, 10 patients were "liquidators" of accident on ChC, 7 patients — inhabitants from territories, contaminated Cs¹³⁷ with level more 5 Ku/km² (a main group). Other 12 patients without additional low-level radiation exposure comprised a control group. The 16 patients were with ischemic heart (12 — angina pectoris FC_{II-III} and 4 — angina pectoris at progress) and 13 with ischemic brain (7 — and 6 — ischemic stroke) diseases.

Character of intercellular interactions was studied with the help of research of concentration of soluble forms of a cellular adhesive molecules (P-, E-selectines, ICAM-1 and VCAM-1), interleukine (1a, 1b, 6, 8 and 10) and endothelin-1 by ELISA method (analyzer "Biomek-1000", Beckman, the USA; kits of "R&D" company, GB and "Immunotech", Fr).

For studying intercellular interactions by us the model of a thrombogenesis and post-stenosis separations of a blood-groove on a secretion of cytokines and free forms of molecules of a cellular adhesion which has allowed estimating character of changes of their concentration in reply to processes of coagulation of a blood and a fibrinolysis is developed.



The state vessels-platelet a link of system of a hemostasis at the survived patients is characterized by infringement of intercellular interactions in systems "platelet-platelet" (homotypic adhesion) and "platelet-substrate" (a heterotypic adhesion such as "cell-substratum" — "platelet-fw") and specifies shift hemostasiological in reply to use of a wide spectrum of inducers (ADP, an epinephrine, ristocetinum).

The initial level of all solvable forms of molecules of a cellular adhesion and the basic proinflammatory (mainly IL-1bb and IL-6) cytokines at patients of the basic bunch appeared authentically higher. The greatest interest represents analysis of dependences between a secretion of cytokines and molecules of a cellular adhesion. So, initial level ICAM-1 authentically negatively correlated with levels of secretion IL-1bb, IL-8 and IL-10 in the rheologic test ($r = -0,76$; $-0,74$ and $-0,71$; $p < 0,02$, accordingly), and initial level VCAM-1 appeared negatively connected with secretion IL-8. Authentic negative communication between initial level IL-10 and ICAM-1 is found during coagulation of a blood ($r = -0,65$; $n = 29$; $p < 0,05$), a strong feedback between the maintenance initial P-selectines and ET-1 in rheologic (fig. 1) and coagulation assays ($r = -0,9$ and $-0,89$; $n = 29$; $p < 0,002$). VCAM-1 level statistically significantly negatively correlated with a degree and rate of an adhesion of platelet (the first phase ristocetinum-aggregation, $r = -0,85$ and $r = -0,59$; $n = 29$; $p < 0,05$), appeared closely connected in due course epinephrines — aggregations ($r = 0,71$; $n = 12$; $p < 0,05$), E-selectines appeared negatively connected with activated particulate thromboplastine time ($p < 0,05$), and level E-selectines negatively correlated with arperационной activity of platelet ($p < 0,05$).

Taking into account synchronic character of change of maintenance E-selectines, IL-6 and IL-10 as a result of coagulation, and also a possible general path of transduction of the signal, sold through subunit gp130, it is necessary to assume, that at the patients who are subject to low-levelled radioactive influence, takes place regulations дисбаланс the cytokines, connected with augmentation (in comparison with norm) secretions and/or shad in reply to activation a signal that can bring the essential contribution to development of an atherosclerosis.

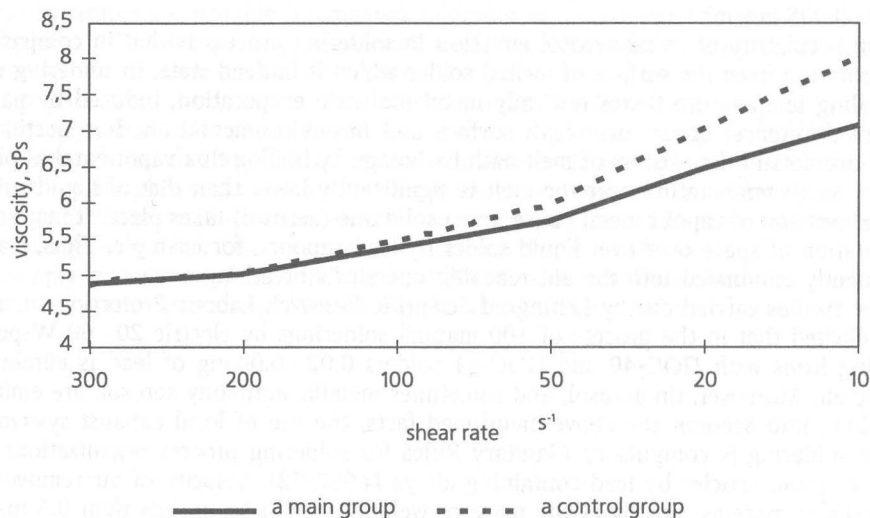


Fig. 1. Rheological characteristic in patients with ischemic heart and brain diseases exposed by low-level of ionizing radiation after the Chernobyl catastrophe



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