

**THE STATE OF THE PRO AND ANTIOXIDANT SYSTEM OF  
BLOOD AND PLATELETS IN WOMEN WITH INFLAMMATORY  
DISEASES OF THE UTERINE APPENDAGES.**

**Usmonova G.A.**

*Andijan state medical institute*

**Abstract.** In the pathogenesis of inflammatory diseases, vascular disorders and microcirculation disorders, as well as the possible role of membrane disorders, are of great importance. At the same time, in a number of systemic studies devoted to establishing a relationship between structural and functional changes in platelet membranes, the intensity of the pro- and antioxidant systems, no disturbances in the hemostasis system were carried out. These changes in platelets can also lead to a violation of the integrity of the capillaries, further aggravating the disorder of microcirculation.

**The aim of this study was:** To study the pro- and antioxidant system of platelets and their functional activity in patients with VZPM.

**Material and research methods.** Depending on the method of treatment, all patients were divided into 2 groups. The first group consisted of 30 healthy women. The second group included women with VZPM = 100. The age of the examined women ranged from 21 to 45 years, averaging  $29.8 \pm 1.1$  years. The activity of antioxidant enzymes - superoxide dismutase and glutathione peroxidase was determined using the methods and recommendations of Archakov and Vladimirov.

**Results and its discussion.** The normal functioning of platelets also implies the presence of a good ability of its membrane to deform, which is necessary for free movement through the capillaries.

According to the literature, platelet dysfunction may be associated with a violation of the integrity and shape of their membranes. One of the reasons for this is an increase in the content of cholesterol and phospholipids in the composition of membranes in the blood plasma, as well as the accumulation of products of lipid

peroxidation, accompanied by a decrease in the level of its antioxidant activity. These changes in platelets can also lead to a violation of the integrity of the capillaries, further aggravating the disorder of microcirculation.

Despite the importance of the morphofunctional usefulness of platelets for hemomicrocirculatory homeostasis, we did not find in the literature information about their condition in patients with VZPM. Inflammation leads to the activation of peroxide processes lipids. In women with VZPM, blood plasma had an increased content of lipid hydroperoxide compared to the control (Table 1).

Table 1

Characterization of biochemical factors of blood plasma in patients with VZPM

Group of surveyed	The level of hydroperoxides	The level of antioxidant activity (un.op-pl)	Willebrand factor (%)
Healthy women (n=30)	0.26±0.11	1.42±0.12	75.6±8.01
Women with IBD (n=110)	0.68±0.04	0.74±0.21	109.6±10.3
R	<0.001	<0.01	<0.05

According to a number of authors, an increased level of free radicals in the blood in patients with VZPM is due to the increasing activation in some tissues (endothelium, blood cells, adrenal glands, liver) of adaptive metabolic processes accompanied by the production of reactive oxygen and nitrogen species, in particular, the reaction of synthesis and inactivation of steroids, purine catabolism (Many A. et al., 2006; Boggess KA et al., 2018). It follows from the data we have obtained. That an increased level of free radical metabolites in blood plasma is accompanied by an insufficient increase in the activity of the antioxidant system, which undoubtedly has an adaptive nature and is the main factor in stabilizing oxidative stress. Meanwhile, in this situation, we observe a lack of adaptive antioxidant Systems in the blood..

So, significant disturbances in the lipid spectrum of blood plasma, platelets, and high LPO activity explain the high frequency of violations of the

morphofunctional properties of platelets in patients with VZPM. Structural changes in the platelet membrane, causing a decrease in its deformation, contribute to damage to the vascular endothelium, which leads to an increase in the level of von Willebrand Factor.

A significant risk factor is also the activation of lipid peroxidation in platelets, which causes destructive changes in platelet membranes. In patients with VZPM, an increase in the level of MDA by 2.5 times is noted (Table 2), which, of course, affects the functional activity of platelets, changes in the physicochemical properties of membranes.

table 2

Indicators of the pro- and antioxidant system of platelets in patients women with IBD

Indicators	Healthy women (n=30)	Women with IBD (n=110)	R
Platelet malondialdehyde level (nmol/MDA 1 min/mg protein)	1.81±0.12	4.61±0.31	<0.001
Glutathione peroxidase activity (unit active/mg protein)	22.43±0.84	18.41±0.71	<0.01
Superoxide dismutase activity (unit active/mg protein)	12.41±0.33	10.95±0.42	<0.01

In the study of the activity of enzymes of the antioxidant system of platelets. A decrease in the activity of glutathione peroxidase and superoxide dismutase was revealed. Obviously, low values of enzyme activity are also the reason for the accumulation of LPO products in platelets.

With VZPM, free radical processes are activated, and there is also a connection between the intensity of lipid peroxidation and platelet activity, through which the relationship between cellular and coagulation hemostasis is largely realized, their importance in maintaining the integrity of the vascular wall and in continuous blood coagulation, necessitates a detailed study of the state of platelet and procoagulative hemostasis.

**In this way**, the study of platelet membranes in patients with inflammatory diseases of the uterine appendages, indicates a violation of the structural and functional state of the membranes of these blood cells, a violation of the platelet-coagulation link of hemostasis and the inseparable connection of rheological disorders, depending on the nature of the manifestations of the clinical picture of inflammatory diseases of the uterine appendages.

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