**FUNCTIONAL STATE OF THE MYOMETRIUM OF THE RATS UNDER CHRONIC IN VIVO ACTION OF ZnO AND ТіО2 NANOPARTICLES**

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The specificities of the structure and blood supply of the uterus facilitate a considerable accumulation of nanosize xenobiotics, including nanoparticles of metal oxides, in its tissues. Numerous *in vitro* and *in vivo* experiments demonstrated that nanoparticles of metal oxides (ZnO and TiO2) have significant cytotoxic activity, caused by the oxidative stress induction. However, there is no information about the impact of these nanomaterials on the functional state of the myometrium under chronic exposure of the organism.

The tenzometric methods and mechanokinetic analysis were used in this work to investigate the contractive activity of the myometrium of non-pregnant rats, which was either spontaneous or induced by oxytocin, the uterotonic hormone, and acetyl choline, the agonist of muscarinic choline receptors, under chronic peroral intake of the aqueous ZnO and TiO2 nanocolloids into the organism.

It was found that when the rats were burdened with the aqueous ZnO and ТіО2 nanocolloids, there were no changes in the pacemaker-dependent mechanisms, forming the frequency of spontaneous contractions in the myometrium, but there was a considerably induced increase in the AU index of contractions.

It was determined that if the rats were burdened with the aqueous ZnO and TiO2 nanocolloids, there were no changes in pacemaker-dependent mechanisms, forming the frequency of spontaneous contractions of the myometrium, but the changes in their amplitude were opposite in their directions: enhanced – in the former case, and suppressed – in the latter. There was also a considerable increase in the AU efficiency indices of contractive activity.

When the rats were burdened with aqueous ZnO nanocolloids for 6 months, during the cholinergic excitation there was hyperstimulation of both М3-receptor-dependent mechanisms of Са2+ ions intake via potential-governed Са2+-channels of L-type into the smooth muscles of the myometrium, and М2-receptor-dependent mechanisms, controlling the intracellular concentration of these cations. When the rats were burdened with the aqueous TiO2 nanocolloids, the abovementioned changes had the same direction, but were much smaller in the magnitude.

It was found that the main targets for the effect of the aqueous ZnO and ТіО2 nanocolloids were the mechanisms, regulating the intracellular concentration of Са2+ ions during the oxytocin-induced excitation of the myometrium both under chronic and short-term burdening of the rats with these nanomaterials (especially at the effect of ZnO).