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ANTIDEPRESSANT TIANEPTINE (TIA) ACTION IS BASED ON THE ACCELERATION OF SEROTONIN TURNOVER IN THE SYNAPSE: A HYPOTHESIS

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Introduction: Neurochemical mechanism of TIA action is not clear.

Aim: To develop possible mechanism of TIA action in patients with anxious depression (Uzbekov et al., 2006, 2009).

Results: It was found twofold increase of platelet monoamine oxidase (MAO) activity in depressed patients and its significant decrease under TIA action.

Discussion: Synapse is considered as a complex biological system (nerve ending + astrocytes). It is supposed that at normal conditions about 75 % of serotonin released in synaptic cleft undergoes functional inactivation by its reuptake in presynaptic ending. The remaining serotonin is taken up by astroglia and is undergone its irreversible (chemical) inactivation under MAO action.

According to our hypothesis TIA enhancing serotonin reuptake decreases serotonin level in synaptic cleft. Simultaneously in patients-responders we have established the decrease (inhibition) of MAO activity that promotes increase of serotonin concentration in synaptic cleft. It has been shown that TIA activates serotonin release from presynaptic ending (Labrid et al., 1992). Thus TIA enhances not only serotonin reuptake but simultaneously activates its surge from the ending into synaptic cleft. We conclude that under TIA action serotonin turnover rate in the synapse is increased that promotes increase in the unit of time serotonin concentration on postsynaptic receptors; this process is accompanied by decrease of MAO activity.

Conclusion: The first time in the literature we propose the hypothesis about neurochemical mechanism of TIA action. Proposed mechanism mainly refers to the first acute phase of TIA action directed on the normalization of serotonergic neurotransmission.

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