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The impact of 1,3,4-thiadiazine derivates (L-14, L-17) on the hematological profile of alloxan-induced diabetic rats

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Abstract

We have studied 2-aminopropylmorpholino-5-phenyl-6H-1, 3, 4-thiadisine dihydrobromide (L-14) and 2-morpholino-5-phenyl-6H-1, 3, 4-thiadiazine hydrobromide (L-17), which combine antioxidant and antiglycative properties. The absence of myelotoxic effect is required for antidiabetic agents. So the aim of this research is to reveal hematological changes in diabetes rats treated with L-14 and L-17. Forty (40) male Wistar rats were used in accordance with the ethical principles of the Directive 2010/63/EU, divided into four groups: control, alloxan diabetes (AD), alloxan diabetes plus L-14, alloxan diabetes plus L-17. Rats were given alloxan injections (100 mg/kg/day, i.p., three days) to induce type-1 diabetes. L-14 and L-17 was injected intramuscularly (40 mg/kg/day, simultaneously with alloxan, 12 injections for four weeks). Hematological analysis of peripheral blood was performed by hemoanalyser Celly70 (Biocode Hycel). Alloxan diabetes after 30 days leads to significantly increase of mean corpuscular hemoglobin concentration (MCHC), erythrocyte anisocytosis (RDW), neutrophilic leukopenia, low platelet count and mean platelet volume (MPV). L-14 reduces MCH, MCHC and WBC, but not the RDW-changes. L-14 also causes significant increase in platelet count in comparison to control rats and MPV-recovery. L-17-treatment leads to increase in hemoglobin, MCH, MPV and platelet distribution width. But MCHC and RDW return to the physiological norm. Neutrophilic leukopenia persists at the level of AD-group. We have not found any myelotoxic effects of L-14 and L-17. Some hematological changes of AD-rats were recovered by investigated compounds, so, L-14 and L-17 are promising for the metabolic correction in diabetic conditions. The study was supported by the Russian Science Foundation grant 16-15-0039-П.

Biography:

Mukhlynina has completed her PhD from Ural Federal University. She is the Researcher of Institute of Immunology and Physiology, Laboratory of Morphology and Biochemistry. She has published more than seven papers in reputed journals. The field of her scientific interest belongs to connective tissue physiology and regeneration.

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