**Cover letter**

**Title:** Effect of Alpha-lipoic Acid on the Corrected QT Interval, QT Dispersion and Spatial QRS-T Angle in Patients with Type 2 Diabetes Mellitus and Cardiac Autonomic Neuropathy

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Dear Editor,

In our manuscript we report the results of our investigation aimed to access the effects of alpha-lipoic acid (ALA) on the corrected QT interval, QT dispersion and spatial QRS-T angle in patients with type 2 diabetes mellitus (T2DM) and cardiac autonomic neuropathy (CAN). Although CAN is common and often underdiagnozed complication of diabetes mellitus, its significance has not been fully appreciated and the unified treatment algorithm and known disease modifying treatment is lacking. As the progression of cardiovascular denervation is partly reversible or can be slowed down in the early stages of disease, it is recommended to perform screening for this complication in patients with diabetes mellitus. According to known data it is obvious that the foreground should be therapy aimed at lifestyle modification, intensive glycaemic control, treatment of dyslipoproteinaemia, antioxidants, vitamins, correction of vascular endothelial dysfunction, prevention and treatment of thrombosis.

The many unique properties of ALA, namely antioxidant effects, reduction of glycation reactions, prevention of beta-cell destruction, improvement of glucose uptake, restoration of vitamins levels (such as vitamin E and C), improvement of neurons function and conduction has been shown in some experimental and clinical studies. ALA due to its significant role in mitochondrial bioenergetic reactions was considered as a beneficial therapeutic option in prevention and treatment of chronic diabetic complications.

Our study included 33 patients with type 2 diabetes mellitus and definite stage of cardiac autonomic neuropathy, which were allocated to two treatment groups: control (n=15) received standard antihyperglycaemic therapy; group 2 (n=18) - in addition alpha-lipoic acid 600 mg/d for three months. The QTc interval, QTd and spatial QRS-T angle parameters were analyzed. Results: It was found out that alpha-lipoic acid contributed to decrease of the QTc, QTd and QRS-T angle. Conclusions: The positive influences of alpha-lipoic acid suggests the feasibility of its administration to patients with type 2 diabetes mellitus and definite stage of cardiac autonomic neuropathy. Obtained results suggest that the efficacy of alpha-lipoic acid is the result of its direct effect on the investigated indexes.

The content of the manuscript is original and has not been published or accepted for publication, either in whole or in part, in any form. No part of the manuscript is currently under consideration for publication elsewhere.

Conflict of Interest. The authors declare no conflicts of interest.

Informed Consent and Ethical Approval. The work was done according to the principles of the Helsinki Declaration (2004) and was approved by an Ethics Committee of the Danylo Halytsky Lviv Medical University, protocol №2 from 18 February 2013. All subjects signed an informed consent prior to their inclusion in the study. The research performed corresponded to the generally accepted norms of morality and observance of the rights, interests and personal dignity of the persons participating in the study.

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Sincerely yours,



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