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MAY NEBIVOLOL BE USED AS ANTIGLYCOOXIDANT DRUG? – NEW USE OF BETA-BLOCKERS

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Relevance. One of the leading death causes worldwide remain cardiovascular diseases (CVD). The most important risk factors for CVD include age, improper diet, low physical activity, increased blood pressure, diabetes, overweight, and obesity. That is why many people are affected by CVD more than any other civilization disease. Therefore the need to search for new methods of treatment is crucial. According to recent reports, protein glycation and oxidative stress by stimulation of remodeling and calcification of vessels and activation of proinflammatory factors are involved in the development of CVD. To prevent such processes, it is preferable to use drugs already well-known in cardiology. Beta-blockers - the most common class of cardiological drugs – may have antiglycation and antioxidant properties. However, to date, little is known about the antiglycooxidant properties of nebivolol.

Aim: to assess the antiglycooxidant activity of nebivolol - one of the beta-blockers - in an *in vitro* model of oxidized bovine serum albumin (BSA).

Materials and methods. The experiment was conducted in three series, each time in duplicate. 1 mM nebivolol and 0,09 mM BSA were incubated for six days with 0,5 M glucose used as a glycation agent. In every sample DPPH radical scavenging capacity, total thiols – a product of protein oxidation as well as tryptophan and β-amyloid – products of protein glycation - were assessed colorimetrically/fluorometrically. Aminoguanidine was used as a glycation inhibitor.

Results and their discussion. The beta-amyloid level was significantly lower, while tryptophan and total thiol level were significantly higher in samples containing BSA and glucose with nebivolol than in samples without examined drug. Moreover in vitro DPPH radical scavenging capacity of nebivolol shows intense antioxidant activity. Those results prove that nebivolol has antiglycation and antioxidant properties in an *in vitro* model. Nebivolol may be more successfully used in the treatment of CVD, especially in patients with coexisting diabetes mellitus. However, such studies in animal and human models still need to be conducted.

Conclusion: our experiment confirm that well known and widely used beta-blocker – nebivolol – presents antiglycooxidant properties in the oxidized bovine serum albumin *in vitro* model.