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Effect of hypochlorous acid on platelet aggregation in healthy people and in patients with heart failure *in vitro*

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Inflammatory factors are important contributors to pathogenesis of cardiovascular diseases. Activated monocytes and neutrophils excrete enzyme myeloperoxidase, which catalyses production of hypochlorous acid (HOCl) from H_2O_2 and Cl^-. HOCl is unstable compound and strong oxidizing agent affecting plasma lipoproteins, fibrinogen and other proteins. Their alterations have effect on development of atherosclerosis and thrombosis complications. Platelets actively participate in these processes. The published data about HOCl effects on platelet aggregation are inconsistent.

The aim of this study was to determine the dependence of effects of hypoclorous acid on the intensity of platelet aggregation *in vitro* in healthy people and heart failure patients on HOCl concentration.

Methods: Two groups of people were investigated: healthy people (n=10) and heart failure patients (n=18). Platelet aggregation was determined with optical 2-channeled Chrono-log platelet aggregometer. The standard method of changes of relative optical density in aggregating platelet-rich plasma against platelet poor plasma was used. The aggregation was initiated with ADP (3,8 mmol/L) solution. We used 6 samples of the same person plasma. To each sample 10 µL HOCl of different concentrations were added: 2.12 mM/L, 7.06 mM/L, 10.59 mM/L, 21.18 mM/L, and 43.4 mM/L as final concentration. To the control sample the same volume of physiological solution was added. The samples were incubated for 30 min at 37°C, and the intensity of platelet aggregation using ADP was determined (%).

Results: It was determined that high concentrations of HOCl (from 2.12 to 43.4 mM/L) significantly decreased platelet aggregation in both groups. We observed that the icreasing concentration of HOCl was reversely proportional to the intensity of platelet aggregation. The decrease of platelet aggregation intensity in plasma of heart failure patients affected with HOCl *in vitro* was more expressed than in healthy people (42.6% and 36.1% respectively).

Conclusions: The intensity of platelet aggregation significantly decreased dependently on HOCl concentration in plasma *in vitro*. Heart failure patients were more affected than healthy people.