Abstract

Charles University in Prague

Faculty of Pharmacy in Hradec Králové

Department of Biological and Medical Sciences

Evaluation of endoglin and P-selectin expression and co-expression in aortas of apoE-deficient mice

Diploma thesis

Monika Brlicová

Supervisor: Mgr. Jana Rathouská

Background: We observed the expression and the reciprocal co-expression of endoglin (receptor III for TGF-β cytokine) and P-selectin (adhesion molecule and marker of endothelial dysfunction) in ascending aortas of apoE-deficient mice which were fed by standard diet for rodents and Western type diet (high-cholesterol diet) for achieving of different phases of the atherosclerotic process. The changes of total cholesterol levels in mice after administration of both types of diets were also evaluated.

Methods: The modified strain C57BL/6J of mice with a deficiency of apolipoprotein E, which is prone to aterogenesis was used for this diploma thesis. Mice were divided into three groups. The first group was fed by standard diet (so-called „chow“ diet) for a period of two months and the second two groups were fed by Western type diet for a period of two and four months. The levels of total cholesterol in the blood were biochemically determinated and then we statistically evaluated this levels in all groups. Immunohistochemical methods have allowed us to detect expression and potential co-expression of endoglin and P-selectin in sections of ascending aorta.

Results: Biochemical analysis showed significantly increased total cholesterol levels in the blood in mice fed by Western type diet for a period of two months against mice fed by a standard diet. On the contrary a nonsignificant changes in total cholesterol levels in the blood was observed among groups of mice fed by Western type diet for a period of two and four months. Increased expression of endoglin was showed in mice fed by Western type diet for a period of two months against mice, which were fed by standard diet on the whole endothelial surface covering atherosclerotic plaque (in the group of

„chow“ diet the plates were not observed in the ascending aorta). On the other hand the expression of P-selectin was seen only in areas of endothelium without plates. Immunohistochemical methods didn’t show any significant co-expression of endoglin and P-selectin.

Conclusions: The diet with high content of saturated fat and cholesterol leads to the significantly higher levels of total cholesterol in the blood against the mice with the standard diet. No significant locations of co-expression were shown in both of these molecules in the evaluation of the expression of endoglin and P-selectin. This conclusion suggesting that endoglin (is not probably involved) in the accumulation of leukocytes in the aorta of apoE-deficient mice in the initial phase of atherogenesis.