ABSTRACT

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Expression of TGF-β signaling proteins in aorta of transgenic mice expressing high levels of soluble endoglin

Rigorous thesis

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Background: The aim of this rigorous thesis was to detect and evaluate the selected proteins expression of TGF-β signaling in the aorta of the two groups of transgenic mice differing in the levels of human soluble endoglin, which were fed a special cholesterol diet.

Methods: For the study have been used 6 months old female mice transgenic strain CBAxC57BL/6J with inserted the gene for human soluble endoglin (sENG). On the basis of ELISA analysis of levels of sENG in the plasma mice were divided into two groups. The screened transgenic group Sol-Eng⁺ (showing high levels of sENG) and the control transgenic group (levels of sENG below detection). For a period of 3 months a high fat and cholesterol diet has been served to both groups. Further biochemical analysis was carried out to determine the levels of total cholesterol and Western blot analysis for the detection and quantification of expression of eNOS/peNOS protein molecules, endoglin (TGF-β receptor III) and TGF-β receptor II in the aortas of the two groups of mice.

Results: The biochemical analysis of total cholesterol in the blood did not show significant differences in the measured values between the group of Sol-Eng⁺ and the control group. Western blot analysis demonstrated a significantly increased the expression of the molecule endoglin by 60% and the receptor of the TGF-βRII 54% for group Sol-Eng⁺ in comparison with the control group. However, it did not demonstrate
a statistically significant difference for eNOS and peNOS molecules between the two groups.

Conclusions: The results of this study point to a possible share of the increased levels of sENG, in combination with the cholesterol diet on changes in molecules that affect the expression of TGF-β signaling in aortas of the transgenic mice. It can be said – increased levels of sENG have no effect on the expression of molecules for vasodilation and vascular homeostasis. The above data for vascular morphology, however, will need to expand on the results of the testing of the functional parameters of the blood vessels.