

ABSTRACT

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Title of Thesis: Functional analysis of endothelial dysfunction in mice aorta following high-fat diet administration

Background and aim: Endothelial dysfunction is associated with the impairment of vasodilatory response of vessel wall mediated by nitric oxide which is produced by endothelial cells under physiological conditions. Endothelial dysfunction can be induced by high fat diet (HFD) feeding in experimental animals. The aim of this diploma thesis was to determine the effect of HFD on the functional parameters of aorta, especially the effect of the vasodilatory factor acetylcholine on endothelial cells of the thoracic part of the mouse aorta.

Methods: The 7 months old C57BL/6J male mice were fed high fat diet containing 42 % kcal fat for 12 weeks to induce endothelial dysfunction in the aorta. The control group was fed a standard laboratory diet during the whole experiment. Functional parameters of aorta were assessed with wire myograph 620M.

Results: At the end of the experiment, the weight of the animals was statistically significantly lower in the HFD group compared to the control group of mice fed the standard laboratory diet. We did not notice any differences between the control group and the HFD group in vasoconstrictor response of thoracic aorta. The maximal endothelium-dependent acetylcholine-induced vasodilation was the same in both groups. Endothelium-independent sodium nitroprusside-induced vasorelaxation did not show any changes between groups.

Conclusion: The results of this study suggest that long-term feeding with HFD containing 42 % kcal of fat has no effect on the endothelial function in thoracic part of aorta.

Keywords: endothelium, endothelial dysfunction, high fat diet, wire myography