ABSTRACT

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Title of Diploma Thesis: Monitoring the change in expression of selected indicators in the glucose induced endothelial dysfunction in vitro.

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Background: The aim of this diploma thesis was to determine, whether the new monoclonal antibody carotuximab affects the expression of endoglin and other biomarkers of endothelial dysfunction (eNOS, ICAM-1, VCAM-1, E-selectin) in human aortic endothelial cells exposed to high glucose.

Methods: Human aortic endothelial cells (HAEC) were exposed to high glucose levels (45 mmol) for 72 hours and carotuximab (300 μg/ml) for 12 hours. We measured the gene expression of endoglin, eNOS, ICAM-1, VCAM-1, E-selectin by real-time PCR. We measured endoglin and ICAM-1 protein levels by flow cytometry.

Results: Gene expression of endoglin and all biomarkers of endothelial dysfunction was significantly increased after high glucose. After the addition of carotuximab to high glucose, we observed a significant increase in gene expression of eNOS, while no significant difference was measured in endoglin or other markers of endothelial dysfunction. Protein levels of endoglin were significantly increased after high glucose and after the addition of carotuximab we observed a significant decrease in protein levels of endoglin. The protein levels of ICAM-1 were significantly increased after high glucose and the addition of carotuximab led to a further increase of ICAM-1 protein levels.

Conclusion: These results demonstrate that carotuximab has an effect on high glucose-induced expression of endoglin and other biomarkers of endothelial dysfunction, but the consequences of these results need to be further investigated.

Key words: endoglin, endothelial dysfunction, hyperglycemia, carotuximab (TRC 105)