Abstract

Cardiovascular diseases are the major causes of death worldwide. Studying factors leading to initiation and progression of atherosclerosis and its complications leads to a better understanding of underlying mechanisms of this disease and to development of novel treatments. Adhesion of monocytes on the endothelial surface is the initial step of atherosclerosis. The main aim of this study was to establish and test an *in vitro* model of monocyte adhesion on the endothelial cells and to evaluate the results by means of two methods – measuring the fluorescence signal intensity and counting adhered cells. Because of its well known effects on endothelial cells activation and adhesion molecules expression TNF-α was chosen for endothelial cells stimulation. The lowest concentration of TNF-α affecting the percentage of adhered monocytes in comparision with negative control was 1 ng TNF-α/ml. The optimal concentration of TNF-α increasing the percentage of adhered monocytes was 10 ng TNF-α/ml. The influence of TNF-α on the adhesion was observed already after 5 minutes of coincubation of THP-1 monocytes with HUVEC. Using the optimal concentration of 10 ng/ml led to the highest percentage of adhered monocytes after 30 – 40 minutes of coincubation with HUVEC. Other factor affecting the percentage of adhered monocytes (along with the TNF-α concentration and the time of coincubation) was the amount of added THP-1 monocytes. The model of monocyte adhesion on endothelium *in vitro* was optimalized and results were evaluated by using two methods.

Key words: monocytes, endothelium, adhesion