

LONGER PRESERVATION OF THE FUNCTIONAL CHANGES INDUCED BY INFLUENZA A VIRUS AND (OR) LPS IN THE SUBLINES OF HUMAN ENDOTHELIAL CELLS ECV-304

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Influenza A virus and secondary bacterial infection can cause long-term consequences, such as cardiovascular complications or fibrosis of various organs, but mechanisms of occurrence of the complications are not well understood. In the current study a comparative assessment of the functional changes in the sublines of human endothelial cells ECV-304 that were obtained previously by the long-term cultivation of cells after exposure of different infectious doses (ID) of influenza A virus and (or) bacterial lipopolysaccharide (LPS) was carried out. It was shown that the functional changes in endothelial cells in migration activity, cell permeability and mRNA expression of cytokines TNF α and TGF β after introducing of pathogenic agents (influenza virus and (or) LPS) and after prolonged cultivation (6th passage) continue to be observed (as such as the changes in proliferative activity that had shown by us earlier). The nature of the changes depended on the type of agent (agents). The differences in migration activity between the sublines of cells at the 6th passage in the point of maximum activity (4 hours after wounding) were correlated to the differences in proliferative activity of this cells at the 1st passage (data on proliferation had obtained earlier). So, increased migration and cell proliferation were observed in the sublines under influence of the low dose of the virus (ECV-1ID) and under influence of LPS (ECV-LPS), and suppression of migration and cell proliferation were observed in the subline under influence of the high dose of the virus (ECV-1000ID). An increase in mRNA expression of cytokines TNF α and TGF β was detected in the sublines ECV-1ID, ECV-LPS and especially ECV-1ID+LPS, and it didn't lead to induction of cell apoptosis. An increase in permeability of cells of the studied sublines was also shown (as indicated by a decrease in mRNA expression of occludin and ZO-1 – are the tight junctions proteins). The impact of antiviral drugs rimantadine and alpisarin on the functional state of cellular sublines was assessed, its results indicates about the possibility of these drugs to prevent the development of pathological changes in endothelial cells caused by influenza A virus and (or) LPS. These results may be useful for studying of mechanisms of the development of complications induced by influenza A virus and secondary bacterial infection.

Keywords: endothelial cell line ECV-304, lipopolysaccharide (LPS), influenza A virus, cell migration, permeability