

Detection of Relationship between the Number of Repeated Surgeries Prior and Post Long-lasting Free Flap Surgeries and Active HHV-6 or HHV-7 Infection

Arnīs Vilks¹, Jevgenijs Stepanovs², Modra Murovska³, Biruta Mamaja^{1,4}

¹ Rīga Stradiņš University, Doctoral Studies, Latvia

² Rīga Eastern Clinical University Hospital, Latvia

³ Rīga Stradiņš University, A. Kirchenstein Institute of Microbiology and Virology, Latvia

⁴ Rīga Stradiņš University, Department of Anaesthesiology and Reanimatology, Latvia

Introduction. Human herpesvirus 6 (HHV-6) and human herpesvirus 7 (HHV-7) are classified as members of the roseolovirus genus of the betaherpesvirinae subfamily. HHV-6 and HHV-7 are very closely related. Most HHV-7 proteins share 30% to 60% amino acid sequence identity with their HHV-6 counterparts. HHV-6 and HHV-7 infect T lymphocytes in vivo and in vitro, causing similar damage to infected cells. The most common outcome of infection with these viruses is a lifelong dynamic biological interaction between the virus and host that seldom manifests as a disease. The stimulus for reactivation of these viruses is immunosuppression.

Aim. The aim of the study is to detect the relationship between the number of operations/re-operations and active HHV-6 or HHV-7 infection pre and post long-lasting microvascular free flap surgery.

Material and methods. 58 patients after trauma to whom long-lasting (average 5.7 h) microvascular free flap surgery was carried out were enrolled in this study. Peripheral blood samples for the detection of viral infection markers were collected before and 10 days after surgery. HHV-6 and HHV-7 genomic DNA was detected using nested polymerase chain reaction (nPCR) with corresponding primers. The presence of viral sequences in peripheral blood leukocytes (PBL) DNA was a marker of latent/persistent viral infection and in plasma DNA – of active viral infection. Pearson's Chi-square test and the Spearman correlation coefficient for data analysis were used.

Results. Prior to long-lasting surgery, 54 patients had previous operations. In 10 patients active HHV-6 or HHV-7 infection was detected. There was no statistically significant ($p = 0.8$) correlation between the number of operations and active HHV-6 or HHV-7 infection observed. After the long-lasting surgery active HHV-6 and HHV-7 infection was detected in 17 patients. Comparing the number of cases (in all patients) with active HHV-6 or HHV-7 infection before and after long lasting surgery we found statistically significant ($p = 0.001$) increase in the number of active infection cases. After the long-surgery in patients 24 repeated surgeries were carried out. There was no statistically significant ($p = 0.94$) correlation between active HHV-6 or HHV-7 infection and number of re-operations identified. However, in correlation diagrams there is a clearly visible relationship among the active HHV-6 or HHV-7 infection before and after the long-lasting free flap surgery and a greater number of operations/re-operations. The reason for the statistical insignificance could be the comparatively small sample size.

Conclusion. In patients to whom a greater number of operations/re-operations are carried out more frequent occurrence of active HHV-6 and HHV-7 infection is observed. The results of this study highlight the potential role of active viral infection and immunosuppression in pre and post operation clinical course.