“Promotion of International Cooperation
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Effect of General and Regional Anaesthesia on Activation of Beta-Herpesviruses, Immune Response and Postoperative Period in Prolonged Reconstructive Surgeries

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Background (1)

- Reconstructive free flap surgery is a complex method of wound closure for large wounds not amenable to linear (primary) closure
- It involves the transfer of free tissue (skin, muscle, bone or a combination) to a site of tissue loss where its circulation is restored via microvascular anastomoses

Background (2)

- Beta-herpesviruses HHV-6 and HHV-7 are immunomodulating viruses
- After primary infection infecting individuals persistently throughout the life
- The stimuli for reactivation of these viruses are uncharacterized, but are likely to include immunosuppression
- Clinical and experimental evidence indicates that HHV-6 and HHV-7 can interfere with the host immune system through a variety of mechanisms
- HHV-6 and HHV-7 infect cells of immune system as an integral part of their life cycle
- HHV-6 and HHV-7 have the potential to impair host defence system seriously

Background (3)

- Anaesthesia is essential factor suppressing the immune system, in particular cell-mediated immunity, in the post-operative period
- Anaesthesia-associated immunomodulation and intensification of immunosuppressive effect by beta-herpesviruses activation can increase susceptibility of patients to other infections such as bacterial, fungal infections and provoke postoperative complications, e.g., wound-healing disturbances and infections

Aim of the study

- To investigate the presence of HHV-6 and 7 HHV-7 in patients before prolonged reconstructive flap surgery
- Effect of this surgery upon general and regional anaesthesia on activation of HHV-6 and HHV-7
- How this activation affects postoperative period course

Materials and Methods (1)

- 38 patients (aged 5-65) who were undergoing long lasting (5-9 h) reconstructive flap surgery
- Patients were divided into 2 groups - general anaesthesia (n=17) and regional anaesthesia (n=21)
- Patients were not randomized depending on anaesthesia method but surgical necessity
- Priority was given to regional anaesthesia

Materials and Methods (2)

- Peripheral blood samples for the detection of latent or active viruses were collected from patients before and 10 days after surgery
- The presence of viral sequences in peripheral blood leukocytes (PBL) DNAs - marker of latent/persistent viral infection
- The presence of viral sequences in plasma DNAs – marker of active viral infection
- Peripheral blood CD4+, CD8+, CD38+, and CD16+ positive cells were detected by laser flow cytofluorometer

Materials and Methods (3)

- Duration of postoperative period
- Time spent in the intensive care units (ICU)
- Number of repeated and unfavourable surgeries after the reconstructive flap surgery

Results (1)

Percentage of latent/persistent and active HHV-6 and HHV-7 infection before and after anaesthesia and surgery

	Before the surgery		After the surgery	
	Latent/ persistent	Active	Latent/ persistent	Active
HHV-6	36.84%	7.89%	34.31%	10.51%
HHV-7	60%	21%	50%	31.57%

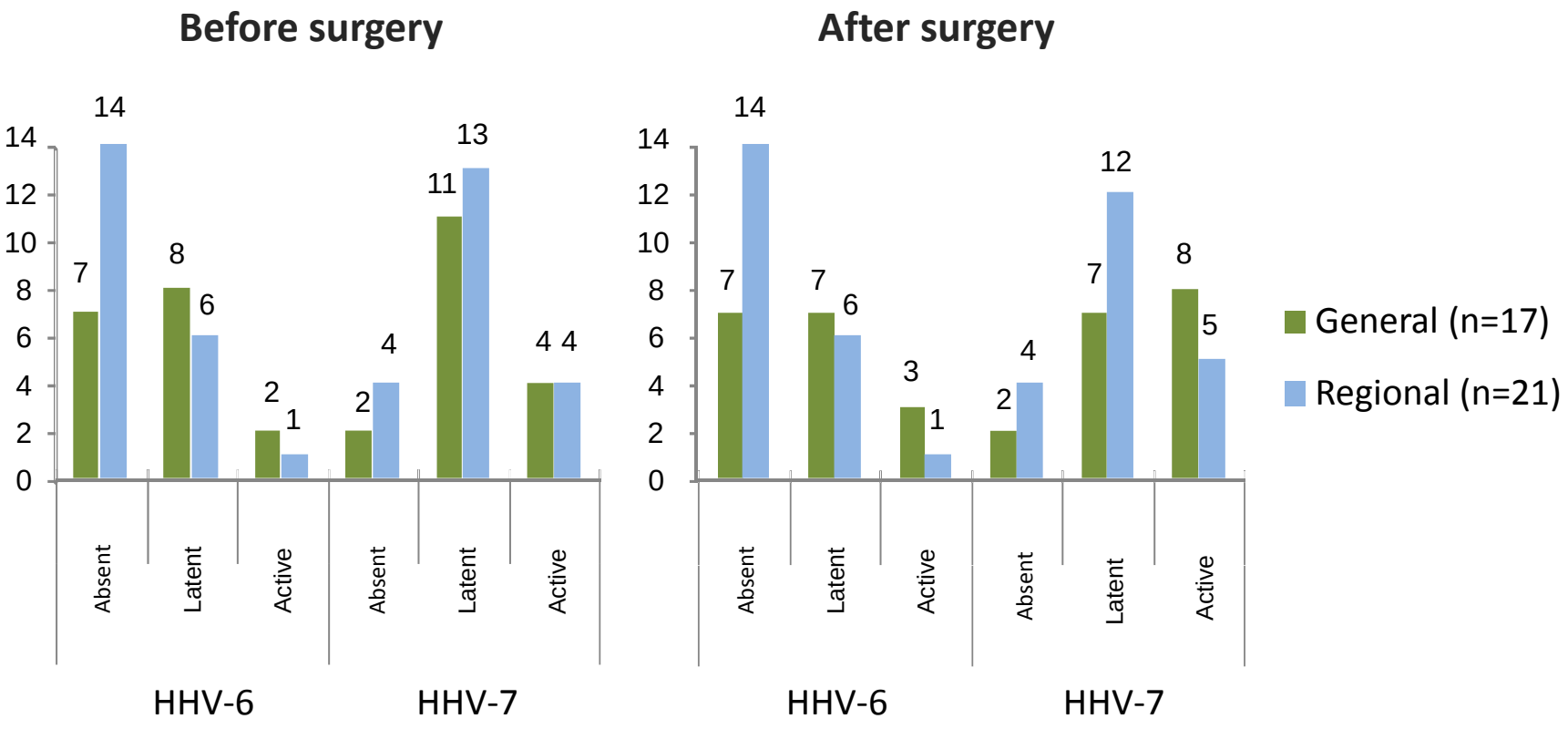
Results from previous studies

	Our study	Previous study*
HHV-6	44,7%	8%
HHV-7	84,1%	43,3%

Kozireva et al., 2001

Results (2)

Frequency of latent/persistent and active HHV-6 and HHV-7 infection before and after anaesthesia and surgery



Results (3)

Immune response of RA group before and after surgery

	Lymphocytes	CD4	CD8	CD38	CD16	CD4/CD8
Before	1668.85 ±606,08	837.32 ±486,1	435.89 ±203	508.95 ±184.6	221.53 ±121.46	1.97 ±0.14
After	1622.63 ±450	773.79 ±217.8	388.74 ±130.7	**626.16 ±196***	267.42 ±187.95	2.10 ±0.16

Data are means and SD; * $p<0.05$

Results (4)

Immune response of GA group before and after surgery

	Lymphocytes	CD4	CD8	CD38	CD16	CD4/CD8
Before	1733.82 ±618.42	801.53 ±381.6	467.29 ±203	529.94 ±257.5	223.41 ±143.1	1.86 ±0.1
After	1689.12 ±548.3	780.31 ±241.3	429.44 ±130	665.94 ±227.9	266.53 ±171.3	2 ±0.12

Data are means and SD

Results (5)

The main characteristics of postoperative period

	General Anaesthesia	Regional Anaesthesia
All patients	**(n=17)**	**(n=21)**
Number of unfavourable surgeries	6	2
• Surgical site infections	4	2
• Flap ischemia	2	0
Number of repeated surgeries until second blood sample (n)	2.38±0.9	1.2±0.3
Time spent in ICU (days)	4.17±9.77	2
Duration of postoperative period (days)	23.76±20.75	11.5±8.76

Conclusion

- The presence of HHV-6 and HHV-7 infection in our study group was significantly high
- Reactivation of HHV-6 and HHV-7 infection is more frequent in patients to whom general anaesthesia is applied
- Our results suggesting that reactivation of HHV-6 and HHV-7 infection is possibly related to longer and more complicated postoperative period with a worse clinical outcome

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Thank you for your attention!