Frequency of HSV1/-2 and VZV viraemia in paediatric haemato-/oncologic patients and its association with (muco-)cutaneous lesions

Medical University of Graz

Alexandra Kroiss¹, Markus Keldorfer¹, Harald H. Kessler², Evelyn Stelzl², Stephan W. Aberle³, Hans Jürgen Dornbusch¹, Daniela Sperl¹, Anna Karastaneva¹, Herwig Lackner¹, Christian Urban¹, Volker Strenger¹

¹Department of Paediatrics and Adolescent Medicine, Medical University of Graz, Graz, Austria
²Institute of Hygiene, Microbiology and Environmental Medicine, Medical University of Graz, Graz, Austria
³Center for Virology, Medical University of Vienna, Vienna, Austria

Background: *Herpes Simplex Viruses (HSV-1/2)* as well as *Varicella Zoster Virus (VZV)* infection or reactivation may lead to relevant complications in immunocompromised patients including haemato-/oncologic patients and stem cell transplant recipients. While vesicular and aphthous lesions are leading symptoms, frequency and impact of HSV and VZV viraemia is unclear.

Materials/methods: We retrospectively analysed HSV-1/2 and VZV PCR results from blood, cerebrospinal fluid (CSF), swabs and mouthwash, in paediatric haemato-/oncologic patients of the Medical University of Graz between 2001 and 2017 as well as their medical reports, in order to describe frequency of viraemia, its association with muco-/cutaneous lesions and/or other symptoms. The PCR scans were performed for viral screening once a week in high risk patients (children undergoing stem cell transplantation or a high risk ALL- or AML-therapy) or as a routine virus panel for diagnostic purposes if a viral infection was suspected. Primers and laboratory techniques changed during the long study period.

Results: Overall, 17.262 specimens obtained from 671 patients (age 0.0–26.5, median 10.1 years) were analysed. HSV-1 was detected in 86 (13.7%) of 593 tested patients (for Details see Tab. 1). HSV-1 viraemia was detected in 38 (7.3%) of 519 tested patients. In viraemic patients, HSV-1 concurrently was detected in swabs or mouthwashes in 9 (81.8%) of 11 patients. In 17 viraemic patients (muco-)cutaneous lesions were not tested but in 5 (29.4%) of them lesions were documented. CSF was not tested simultaneously in viraemic patients (and vice versa). Muco-/cutaneous lesions or mucositis have been described in 12 (31.6%) out of these 38 viraemic patients and 3 (7.89%) out of them were in septic conditions with generalised lesions. HSV-2 was detected in 2 (0.04%) of 5.015 tested specimens (1 each in CFS and blood) according to 0.35% of 564 tested patients. The HSV-2 viraemic patient was without any lesions, mucositis or fever, whereas the patient with the positive CSF result suffered from encephalitis and was successfully treated with aciclovir. VZV was detected in 25 (4.30%) of 581 tested patients (for Details see Tab. 3). VZV viraemia was detected in 12 (2.25%) of 534 tested patients. In viraemic patients, VZV concurrently was detected in swabs in 2 (50%) of 4 patients. In 8 viraemic patients (muco-)cutaneous lesions were not tested but in 6 (60%) of them lesions were documented. Eight (66.7%) of the 12 viraemic patients were described with muco-/cutaneus lesions, whereas the remaining 4 (33.33%) viraemic patients did not show any signs or symptoms of any infections. CSF was not tested simultaneously in viraemic patients (and vice versa).

Conclusions: In paediatric haemato-/oncologic patients, HSV-1 and VZV are far more frequently detected than HSV-2. HSV-1 viraemia was therefore seen in 7% of tested patients (but only in 1% of tested blood specimens). Due to the frequent association with muco-/cutaneous lesions and the low clinical impact of viraemia without such lesions, routine screening for viraemia cannot be recommended. Diagnostics should rather be limited to patients with unexplained fever or muco-/cutaneous lesions.

Tab. 1-3: Results for HSV-1/2 and VZV PCR-analyses from different materials

HSV-1		
material	results positive/tested (%)	patients positive/tested (%)
blood	53/ 5.014 (1.06)	38/519 (7.3)
swabs	142/534 (26.59)	64/214 (29.91)
mouthwash	13/78 (16.67)	11/68 (16.18)
CSF	2/92 (2.17)	2/69 (2.90)
bone marrow	3/289 (1.04)	3/159 (0.02)
stool	3/21 (14.29)	2/13 (15.38)
biopsy	1/20 (5.00)	1/14 (7.14)
other	0/237 (0.00)	0/87 (0.00)
total	217/6.286 (3.45)	86/593 (14.50)

HSV-2		
material	results positive/tested (%)	patients positive/tested (%)
blood	1/3.956 (0.03)	1/470 (0.21)
swabs	0/530 (0.00)	0/211 (0.00)
mouthwash	0/58 (0.00)	0/40 (0.00)
CSF	1/77 (1.30)	1/60 (1.67)
bone marrow	0/247 (0.00)	0/131 (0.00)
biopsy	0/28 (0.00)	0/21 (0.00)
stool	0/15 (0.00)	0/8 (0.00)
other	0/104 (0.00)	0/58 (0.00)
total	2/5.015 (0.04)	2/564 (0.35)

VZV		
material	results positive/tested (%)	patients positive/tested (%)
blood	15/3.348 (0.45)	12/534 (2.25)
swabs	17/99 (17.17)	13/65 (20.00)
mouthwash	2/30 (6.67)	2/32 (6.25)
CSF	1/87 (1.15)	1/61 (1.64)
bone marrow	1/230 (0.43)	1/131 (0.76)
stool	0/13 (0.00)	0/5 (0.00)
other	0/2.157 (0.00)	0/263 (0.00)
total	36/5.964 (0.60)	25/581 (4.30)