The human polyomavirus 9 in Czech patients after kidney transplantation, data from unicentric prospective study

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INTRODUCTION: The human polyomavirus 9 (hPyV9), a member of small non-enveloped DNA viruses from viral family *Polyomaviridae*, was first time described in 2011 from the patient after kidney transplantation. This was the reason, why some researches groups have investigate the relationship between this virus and immunosuppression, especially after kidney transplantation, for example van der Meijden at al. (2014), found the human polyomavirus 9 DNA in 21% of examined patients after kidney transplantation.

The study aim: The main aim of our one year study was to confirm the published data about increased findings of human polyomavirus 9 in groups of patients after kidney transplantation in Czech patients.

MATHERIAL AND METHODS: Into the study were accepted 60 patients after kidney transplantation in University Hospital in Hradec Kralove, Czech Republic, partly after recent transplantation (n36, transplantation in 2015) and partly after earlier transplantation (n24, transplantation in 2014). From all patients urine and serum samples were collected. The baseline samples were collected before transplantation (in recent transplantation group) or during first visit in 2015 (in previous transplantation group). The follow-up samples were collected after 1 and 3 months, respectively after 2 and 4 months. For the diagnosis were adopted two previously published real-time PCR protocols using the different part of hPyV9 genome - from VP1 gene (van der Meijden et al., 2014; PCR protocol A) and VP3 gene (Rockett et al., 2013; PCR protocol B). Up to 14 patients received the induction therapy, 8 patients from the group of transplanted in 2014 and 6 patients from the group of transplanted in 2015.

RESULTS: Totally 179 blood and 166 urine samples were examined by protocol A and 34 blood samples and 34 urine samples were examined by protocol B.
All 24 patients with kidney transplantation in 2014 were during study period on active immunosuppressive therapy. During the study period 2 patients developed borderline acute cellular rejection and 2 patients developed acute humoral rejection. All patients from this group were negative of hPyV9 DNA in all collected samples, including biopsies.

Baseline demographic data of study cohort

cohort type	No. patients	No. blood samples	No. urine samples	Mean age (Range)	SEX	
					F (%)	M (%)
solid organs transplantation	60	179* + 34⁺	166* + 34⁺	54.3 (24-74)	15 (25)	45 (75)
Group A	24	71* + 16⁺	71* + 16⁺	53.0 (24-72)	6 (25)	18 (75)
Group B	36	98* + 18⁺	95* + 18⁺	55.1 (28-74)	9 (25)	27 (75)

Notes: * - samples examined by PCR protocol A; ⁺ - samples examined by PCR protocol B
Group A – patients transplanted in 2014, Group B – patients transplanted in 2015

Patients with kidney transplantation in 2015 had during study period triple drug immunosuppression. Protocol biopsies proved during the study period 13 times marks of acute cellular rejection (7 borderline and 4 full developed) and 5 times marks of acute humoral rejection. Also all samples from recent transplanted patients were negative for hPyV9 DNA. Unlike the hPyV9 positivity, 23 patients developed reactivation of cytomegalovirus and 9 patients developed reactivation of BK polyomavirus during the study period.

Conclusion: The negativity of human polyomavirus 9 DNA in all patients was unexpectable and in contrast with published data from other countries. Recently, the discussion to explain this discrepancy has been under way. One of the possible reasons could be the different approach in induction therapy, which is not strictly required in our country.

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