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Differences in pathogenesis of closely related environmental and clinical coxsackievirus B4 isolates

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High mutation rates of enteroviruses create a "cloud" of potentially beneficial mutations at the population level, which allow the viral quasispecies a greater probability to evolve and adapt to new environments. Our aim was to study the influence of intratypic virus strain variability on the course of coxsackieviral (CV) infection. CD1 mice were infected with CV: (i) clinical isolate from the cerebrospinal fluid of a patient – CVB4 AL, (ii) isolate from the stool of the same patient – CVB4 AS, (iii) environmental isolate – CVB4 COV. Mice were observed up to 45 days. Presence of replicating virus, viral RNA and localization of the virus was assessed. 5´NCR and VP1 regions of the viral genomes were sequenced. Differences in weights were observed during the course of experiment. The differences between weights in CVB4 AL-infected and control mice were significant from day 7. The differences between CVB4 AS-, CVB4 COV- infected and control mice were statistically significant from the day 13. CVB4 AL had an affinity for the brain tissue and was detected in brain up to 45 days. CVB4 AS isolate was detected in pancreas and unlike other viruses; this virus was shed in the stool up to day 45. CVB4 COV was detected in pancreas of mice up to day 45; this was the only isolate which induced acute pancreatitis in mice. The environmental virus isolate was localized in the acinar pancreatic tissue as well as in Islets of Langerhans, whereas clinical isolates were detected only in Islets of Langerhans. Sequence analysis of the isolates showed no differences between the CVB4 AL and CVB4 AS in VP1 region. In the 5´NCR one difference was found between the CVB4 AL/AS and CVB4 COV, three differences were found between the CVB4 AL/AS isolates and CVB4 COV in the VP1 region.

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Biography

Martin Sojka, MSc, PhD is a Microbiologist and Virologist, currently working at the Enterovirus Laboratory and Institute of Microbiology at the Medical Faculty of the Slovak Medical University in Bratislava, Slovakia. His work in the field of Virology is focused on the pathogenesis of enteroviruses. He received his BSc, MSc and PhD in Microbiology and Examina rigorosa in Virology from Faculty of Natural Sciences, Comenius University, Bratislava, Slovakia. He is involved in research, teaching and is guiding several BSc and MSc students. He has participated in several national and international projects.

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