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Quantitative PCR system for detection of clinically relevant CMV infections in patients with inflammatory bowel disease

Nils Wethkamp
Head of Molecular Diagnostics, Germany

Several lines of evidence indicate that cytomegalovirus infection can be substantially associated with onset of inflammatory bowel disease, especially in patients who are refractory to immunosuppressive treatment. As cytomegalovirus is widely spread in the population a quantitative detection system was generated which is suitable to differentiate clinically relevant cytomegalovirus infection of the intestine from common latent cytomegalovirus. By using a quantitative real-time PCR approach, cytomegalovirus viral load was evaluated in formalin fixed and paraffin embedded colon biopsy samples of 136 patients diagnosed with inflammatory bowel disease. Besides initial cytomegalovirus testing, the PCR system was also used to monitor therapy response after antiviral treatment. Cytomegalovirus DNA was detected in 27% patients with varying viral loads. Thereof, 13 patients (35%) received an antiviral treatment with 12 of them going into remission (92%). Later, five patients displayed a relapse and three patients who agreed to restart antiviral treatment again showed positive therapy response. A retrospective comparison of viral loads with antiviral therapy response revealed a threshold of 600 cytomegalovirus copies/105 cells as indicative for clinically relevant infection. Interestingly, we found that sensitivity of cytomegalovirus detection by immunohistochemistry was insufficient to reliably identify antiviral therapy responders. In summary, quantitative real-time PCR using formalin fixed biopsy samples is suitable for detection of cytomegalovirus infection in tissue samples of patients with inflammatory bowel disease. Moreover, it allows the definition of a viral load threshold, predictive for clinical relevance concerning antiviral therapy response.

wethkamp@pathologie-vechta.de

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