Equid herpesvirus type 1 (EHV-1) disrupts actin cytoskeleton during productive infection in equine leukocytes

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Abstract

Equid herpesvirus type 1 (EHV-1) is a prevalent causative agent of equine diseases worldwide. After primary replication in the respiratory epithelium the virus disseminates systemically through a peripheral blood mononuclear cell (PBMC)-associated viraemia. EHV-1 is the only alphaherpesvirus known so far which is capable of establishing latent infection not only in neurons but also in immune system cells (mainly in lymphocytes and macrophages). Since leukocytes are not the target cells for viral replication but are used to transport EHV-1 to the internal organs, the question remains how the virus avoids the immune response and whether it could potentially be associated with virus-induced cytoskeletal rearrangements. Therefore, the aim of this study was to investigate the progress of EHV-1 replication in leukocytes stimulated by phytohemagglutinin and the impact of EHV-1 infection on the actin cytoskeleton. Using the real-time PCR method we evaluated the quantity of viral DNA from samples collected at indicated time points post infection. In order to examine possible changes in actin cytoskeleton organization due to EHV-1 infection, we performed immunofluorescent staining using TRITC-phalloidin conjugate. The results showed that EHV-1 replicates in leukocytes at a restricted level but with the accompaniment of chromatin degradation. Simultaneously, infection with EHV-1 caused disruption of the actin cytoskeleton; this was particularly apparent in further stages of infection. Disruption of the actin cytoskeleton may lead to the limited release of the virus from the cells, but may be also beneficial for the virus, since at the same time it potentially impairs the immune function of leukocytes.

Key words: EHV-1, leukocytes, actin cytoskeleton

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