

Multi-assay investigation of viral etiology in pediatric central nervous system infections

ABSTRACT

Introduction: In an attempt to identify a wide spectrum of viral infections, cerebrospinal fluid (CSF) specimens were collected from pediatric cases with the preliminary diagnosis of viral encephalitis/meningoencephalitis in two reference hospitals, from October 2011 to December 2015. **Methodology:** A combination of nucleic acid-based assays, including in house generic polymerase chain reaction (PCR) assays for enteroviruses, flaviviruses and phleboviruses, a commercial real-time PCR assay for herpesviruses and a commercial real time multiplex PCR, enabling detection of frequently-observed viral, bacterial and fungal agents were employed for screening. **Results:** The microbial agent could be characterized in 10 (10%) of the 100 specimens. Viral etiology could be demonstrated in 7 (70%) specimens, which comprises Human Herpesvirus 6 (4/7), Herpes Simplex virus type1 (2/7) and Enteroviruses (1/7). In 3 specimens (30%), *Streptococcus pneumoniae*, *Listeria monocytogenes* and *Staphylococcus aureus* were detected via the multiplex PCR, which were also isolated in bacteriological media. All specimens with detectable viral nucleic acids, as well as unreactive specimens via nucleic acid testing remained negative in bacteriological cultures. **Conclusions:** Herpes and enteroviruses were identified as the primary causative agents of central nervous system infections in children. Enterovirus testing must be included in the diagnostic work-up of relevant cases.