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Oral Session
Viral diagnostics in the immunocompromised

MOLECULAR DIAGNOSIS OF CENTRAL NERVOUS SYSTEM INFECTIONS USING PCR COUPLED TO ELECTROSPRAY-IONIZATION MASS SPECTROMETRY ANALYSIS OF CSF SAMPLES

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Objectives: New rapid and broad molecular diagnostic methods of viral CNS infections are needed to improve the therapeutic management of hospitalized patients. In the present study, we assessed the clinical performances of PCR amplification coupled with electrospray ionization/time-of-flight mass spectrometry analysis (PCR/ESI-MS) for the diagnosis of viral CNS infections.

Samples and methods: Three hundred and twenty-seven cerebrospinal fluid (CSF) samples prospectively tested by routine PCR assays between 2004 and 2012 in two University Hospital Centres (Toulouse and Reims, France), were retrospectively analyzed by PCR/ESI-MS analysis using primers targeted to adenovirus, Human herpesviruses (HHV1-8), BK and JC polyomaviruses , Parvovirus B19 and Enterovirus (EV) and allowing a detection of more that 170 viruses in 11 reporting groups .

Results: PCR/ESI-MS detected single or multiple virus infections in 190 (83%) of the 229 samples tested positive by routine PCR analysis and in 10 (10.2%) of the 98 tested negative samples. PCR/ESI-MS results correlated well with HSV1, VZV and EV detection by routine PCR assays (Kappa tests= 0.80 [0.69-0.92; 95%], 0.85 [0.71-0.98; 95%] and 0.84 [0.78-0.90; 95%], respectively), whereas a weak correlation was observed with EBV (0.34 [0.10-0.58; 95%]). Twenty-six co-infections and 16 uncommon neurotropic viruses (HHV7 (n=13), Parvovirus B19 (n=2) and adenovirus (n=1)) were identified by the PCR-MS analysis whereas only 4 co-infections had been prospectively evidenced using routine PCR assays (P<0.01).

Conclusions: Our results demonstrated that PCR/ESI-MS analysis is a valuable tool to identify common neurotropic viruses in CSF with, however, limitations were identified regarding the sensitivity of EBV and EV detection in CSF. Our findings indicate that this new diagnostic assay might be of major interest to better understanding the clinical impact of multiple or neglected virus neurological infections.