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P0196 Pathogen identification by multiplex Lightmix RT-PCR in patients with meningitis and culture-negative cerebrospinal fluid

Karoline Wagner*[1], Peter Michael Keller[1], Burkhard Springer[2], Valeria Pires[1]

[1]Institute of Medical Microbiology, University of Zurich, Zurich, Switzerland, *[2]AGES, Graz, Austria*

Background: Acute bacterial meningitis is a medical emergency, and delays in initiating effective antimicrobial therapy result in increased morbidity and mortality. Culture-based methods, thus far considered the “gold-standard” for identifying bacterial microorganisms, require 24 to 48 hours to provide a diagnosis. In addition, antimicrobial therapy is often started prior to clinical sample collection, thereby decreasing the probability to culturally confirm the bacterial pathogen.

Materials/methods: To enable a fast and accurate detection of the most important bacterial pathogens causing meningitis, namely *S. pneumoniae*, *H. influenzae*, *N. meningitidis*, *S. agalactiae* and *L. monocytogenes,* we evaluated a commercially available multiplex Lightmix® RT-PCR in 220 cerebrospinal fluid (CSF) specimens. The majority of CSF samples were received by lumbar puncture, but we also included some CSF samples from patients with symptoms of meningitis from the neurology department that were recovered from shunts. CSF samples were analysed by multiplex RT-PCR enabling a first diagnosis within a few hours after sample arrival at our institute. In contrast, bacterial identification took between 24 and 48 hours by culture.

Results: Overall, a high agreement of bacterial identification between culture and multiplex RT-PCR was observed (99%). Moreover, multiplex RT-PCR enabled the detection of pathogens, *S. pneumoniae* (N=2), *S. agalactiae* (N=1) and *N. meningitidis* (N=1), in four culture-negative samples.

Conclusions: This new multiplex RT-PCR represents a low-cost and time-saving method with high-throughput potential. The time-to-result using automated DNA extraction devices (QIASymphony) for CSF specimens followed by multiplex RT-PCR detection was below 4 hours. This fast diagnostic workflow is expected to improve the routine diagnostics for meningitis associated bacterial pathogens as a complement to classical bacteriological CSF culture.