

Abstrakt

The role of molecular genetics methods in diagnostics of neuroinfections

Background: Neuroinfections are serious diseases. They are associated with frequent development of permanent, debilitating consequences or even death.

Aim: The aim of this work was to determine possible contribution of molecular genetic methods to diagnosis of neuroinfections and define potentially preventable agents.

Methods: The prospective study included 1,463 patients who were hospitalized at the Department of Infectious Diseases in Ostrava in the years 2004-2013 of which 283 patients with purulent meningitis and 1,180 patients with aseptic meningitis. The criterion for the diagnosis was the number of elements in cerebrospinal fluid which had to exceed $5 \times 10^6/l$. The diagnosis of purulent meningitis was established by cultivation, PCR for the detection of *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Neisseria meningitidis*, and *Listeria monocytogenes*. The diagnosis of aseptic meningitis was established by serological tests for tick-borne encephalitis, enterovirus, mumps, *Mycoplasma pneumoniae*, and Lyme disease. PCR was used to investigate enterovirus, influenza virus, VHE and herpes viruses.

Result: In case of the 283 patients with purulent meningitis the etiology was established in 73 % cases, PCR method was positive in 35 % cases and it was the only positive method in 18 % cases. The potentially preventable agents were detected in 44 % cases. In 1,180 patients the etiology was established in 60 % cases, PCR method was positive in 12 % cases, it was the only positive method in 10 % cases. The potentially preventable agents were detected in 22 % cases. The advantages of PCR methods were mainly the speed of diagnosis and the ability to determine the agents after starting antibiotic therapy.

Conclusion: Given these results, we consider the use of PCR testing suitable in routine practice. It is necessary to use simultaneously the conventional cultivation methods, and in the case of aseptic neuroinfection to use the serological test because of considerable variability of agents and also because of the fact that sensitivity to antibiotics still can not be determined by PCR. The determination of agents allows targeted therapy of a patient, de-escalation antibiotic therapy, it prevents antibiotic resistance, reduces hospitalization and allows good surveillance of a disease. Vaccination is an important prevention of neuroinfections and it is desirable to increase immunization coverage especially of high-risk groups of population.