Cerebrospinal Fluid Penetration and Pharmacokinetics of Anti-infective Agents
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The use of anti-infective agents for the treatment of suspected or confirmed bacterial or viral infections of the brain and cerebrospinal fluid is dependent on host and antimicrobial factors. Drug lipophilicity and molecular size are important antimicrobial factors. Anti-infective plasma protein binding and cerebrospinal fluid (CSF) active transport are important host factors. Additionally, multi-drug resistant (MDR) organisms are a therapeutic challenge when cultured from CSF. Intravenous therapy is used and intrathecal anti-infective therapy is contemplated for MDR organisms. Patient-specific CSF anti-infective levels and pharmacokinetic parameters over time is not routinely performed for infections involving the central nervous system. Factors that are important for the successful treatment of CNS infection will be reviewed. Microdialysis as a research tool could be used to capture pharmacokinetic parameters (CSF AUC0-T, CSF peak level and elimination from CSF) as well as anti-infective pharmacodynamics using an animal model of bacterial infection.