Stewardship Intervention on Time to Targeted Therapy in Patients with Suspected Cerebral Nervous System Infection
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Background. Empiric treatment for central nervous system (CNS) infections consists of coverage with multiple antimicrobial agents that may be continued until a pathogen can be identified. Identification may take significant time to result, leading to extended durations of multiple antimicrobial agents, delays in targeted therapy and subsequent adverse effects, such as nephrotoxicity and Clostridium difficile infection. A multiplex polymerase chain reaction (PCR) system that can identify 14 pathogens responsible for community-acquired CNS infections in 1 hour was recently FDA-approved for cerebrospinal fluid (CSF) analysis. The objective of this study was to determine the effect of this PCR paired with antimicrobial stewardship (AMS) team intervention on the time to targeted therapy.

Methods. During the intervention (Int) phase (January 25, 2017-April 30, 2017), all PCR results were called to the AMS team, who reviewed clinical data and provided antimicrobial recommendations per pre-determined protocol. Recommendations consisted of de-escalation or addition of therapy. The pre-intervention (PI) group consisted of patients with CSF culture obtained between January 25, 2016 and April 30, 2016.

Results. A total of 138 patients were evaluated; 46 in the Int group and 92 in the PI. Of the 46 patients in the Int group, 25 had a negative PCR result and were never initiated on antimicrobials. One patient required antimicrobial escalation. Twenty patients were started on empiric therapy and were candidates for de-escalation in the PI group; there were no patients with CSF cultures that required therapy escalation, while 33 patients were initiated on empiric antimicrobials. Results from the subgroup of patients in whom empiric therapy was started are shown in Table 1.

Conclusion. Implementation of a multiplex PCR with AMS intervention resulted in decreased time to targeted therapy.

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Table 1.

| Time to targeted therapy, hours, mean ± SD | Preintervention (n = 33) | Intervention (n = 21) | P-value |
|-------------------------------------------|-------------------------|----------------------|---------|
| Mean ± SD                                  | 30.8 ± 38.2             | 15.4 ± 13.9          | 0.06    |
| Average antimicrobial days of therapy per patient-days admitted | 1.64 ± 1.6              | 0.52 ± 0.0           | < 0.05  |
| Time to organ identification, hours, mean ± SD | 119.6 ± 25.0            | 3.9 ± 1.3            | < 0.05  |

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129. How Do Advanced Molecular Tests Compare to Routine Clinical Laboratory Evaluation of CSF in Meningoencephalitis? A Study in 10 Urban Emergency Departments Across the USA
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Background. The EMERGEnCy ID Net Study Group is investigating whether advanced molecular tests (AMT) increase the detection of causative agents in the CSF of patients presenting with meningoencephalitis (ME). We report findings from a pilot study using AMT on 18 CSF samples from 10 US Urban Emergency Departments. The purpose of the pilot was to compare the performance of these four AMT to established clinical laboratory methods.

Methods. We investigated four AMT: (1) BioFire FilmArray ME Panel targeting 14 causative agents; (2) an in-house target-directed next generation sequencing assay targeting 25 agents; (3) a microarray capable of detecting >2,500 agents; and (4) deep metagenomic next generation sequencing. For targeted sequencing, loci from 12 DNA-based and 13 RNA-based pathogens were amplified from the extracts.