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Session: 55. CNS Infections

Thursday, October 4, 2018: 12:30 PM

Background. Herpes simplex virus (HSV) encephalitis is associated with adverse clinical outcomes in 50% of patients. The use and impact of adjunctive steroids in improving the prognosis of this devastating disease is unknown.

Methods. A multicenter international retrospective study of adults (age >15 years) with confirmed HSV encephalitis. An adverse clinical outcome was defined as death or survived with sequelae.

Results. A total of 438 adults with HSV encephalitis were enrolled. The mean age was 50.58 years (15.94, SD), 226 (51.6%) were female and 59 (13.5%) were immunosuppressed. New onset seizures were seen in 91 (20.8%) patients and the median Glasgow coma scale was 14 (13–15, IQR). A total of 73 (16.6%) patients received adjunctive steroids during their hospitalization. Adjunctive steroids were given more frequently to patients with fever (84.5% vs. 66.7%, $P = 0.003$), seizures (38.3% vs. 17.3%, $P < 0.001$), abnormalities on MRI (77.7% vs. 61.8%, $P = 0.017$), lower mean Glasgow coma scales (10.42 vs. 11.3, $P = 0.013$) and it was also associated with a longer length of stay (median duration of 23 days vs. 20 days, $P = 0.012$). Adjunctive steroids were not associated with an impact on adverse clinical outcomes (46.6% vs. 46.9%, $P = 0.95$).

Conclusion. Adjunctive steroids in HSV encephalitis are used more commonly in the sicker patients and are not associated with a benefit in clinical outcomes.

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338. The Use of Multiplex PCR Panel in the Diagnosis of Meningitis in Children

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Thursday, October 4, 2018: 12:30 PM

Background. Cerebrospinal fluid (CSF) culture remains the gold standard for the diagnosis of bacterial meningitis, with viral PCR considered when clinically indicated. These tests can take 48–72 hours to result, during which patients receive empiric antimicrobial therapy and remain hospitalized. BioFire FilmArray[™] Meningitis/Encephalitis panel (MEP) tests CSF for 14 bacterial, viral, and fungal pathogens with turnaround time of 1 hour. The objective of the study was to compare the results of the MEP to that of bacterial cultures, to evaluate the potential impact on length of stay (LOS) and antimicrobial use in our pediatric population.

Methods. A retrospective review of data from MEP processed by Health Network Laboratories in children ≤18 years of age, from February 1, 2016 to December 31, 2017, at Lehigh Valley Children's Hospital.

Results. A total of 220 MEP results were included in the study, with 46 positive samples. Of the positive samples, five were positive for bacterial organisms, four *E. coli* and 1 *N. meningitidis*. Four of the corresponding CSF cultures grew *E. coli*. The CSF culture corresponding to the MEP positive for *N. meningitidis*, was negative, but both samples were collected after one dose of ceftriaxone. Of the positive MEPs, 89% were positive for a viral pathogen, with three samples positive for Herpes Simplex Virus (HSV). MEPs had a lower average turnaround time of 6.9 hours when compared with CSF cultures of 48.8 hours. Average LOS was 5.7 days for those with a negative MEP compared with 3.8 days for those with a positive viral MEP other than HSV. Empiric antiviral treatment with acyclovir was initiated in 58 patients; patients with a negative MEP for HSV received an average of 3.13 doses.

Conclusion. The study showed 100% concordance between MEP and CSF culture for *E. coli* meningitis. The discordance between CSF culture and MEP corresponding to *N. meningitidis* indicates that the increased sensitivity of MEP may play a role in the management of partially treated meningitis. The use of the BioFire MEP may be helpful in decreasing the average LOS in patients where a viral etiology other than HSV is identified. Faster turnaround time of MEP may decrease the number of antiviral doses in those with a negative MEP for HSV.

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339. An Unusual Complication After Dental Procedure Prophylaxis

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Session: 55. CNS Infections

Thursday, October 4, 2018: 12:30 PM

Background. Amoxicillin is first choice for dental procedure prophylaxis. Adverse effects of antibiotics range from gastrointestinal upset to allergic reactions including rash and anaphylaxis, to *Clostridium difficile* colitis. A rare adverse effect is drug-induced meningitis. We present a case of meningitis after amoxicillin use for dental prophylaxis.

Methods. We present a 60-year-old man who presented with altered mental status and agitation. Four days prior to admission, he took amoxicillin for dental prophylaxis

and had transient agitation. Amoxicillin was taken again the day prior to admission and 12 hours post-procedure, patient became agitated, had fever, headache, neck pain, and photophobia. He presented to ER and LP was performed. cerebrospinal fluid (CSF) had 113 nucleated cells with a monocytic pleocytosis. Empiric antibiotics, including ampicillin, were started. Patient's mental status worsened and his fevers persisted. All cultures were negative and antibiotics were stopped by Infectious Disease. He subsequently but slowly improved. Upon further questioning, he had two prior episodes of meningitis in 2011, and 2015, each occurring after amoxicillin prophylaxis for dental procedures. CSF in both episodes had lymphocytic pleocytosis and was consistent with aseptic meningitis. On the basis of his history, there was no indication for dental prophylaxis.

Results. Aseptic meningitis has multiple noninfectious etiologies, including drugs, malignancy, and autoimmune diseases. Amoxicillin-induced aseptic meningitis (AIAM) is a rare adverse reaction with 12 reported cases. The pathogenesis is unknown and clinical signs and CSF findings vary greatly. Thus, AIAM is a diagnosis of exclusion. Given amoxicillin was administered prior to each episode of meningitis in our patient, amoxicillin is the causative agent in each case. We suspect he worsened after admission because of empiric ampicillin used for *Listeria*. Clindamycin was recommended for future dental infections.

Conclusion. Owing to widespread and common use of amoxicillin, clinicians should be aware of this rare side-effect of amoxicillin. Appropriate use of dental prophylaxis is imperative to minimize unnecessary antibiotic use. Thorough history is key for diagnosis.

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340. Clinical Use of a Multiplex PCR Meningitis/Encephalitis Panel at an Urban Tertiary Care Center

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Session: 55. CNS Infections

Thursday, October 4, 2018: 12:30 PM

Background. The FilmArray[®] Meningitis/Encephalitis (ME) Panel (BioFire Diagnostics, Salt Lake City, Utah) is the first multiplex polymerase chain reaction (PCR) test for detection of 14 pathogens in cerebrospinal fluid (CSF) that are commonly associated with meningitis and encephalitis. Its impact on clinical management has not been well evaluated. Our aim was to describe the experience using the ME panel since its implementation at an urban tertiary care center.

Methods. We conducted a retrospective chart review of all patients aged >21 who had CSF samples analyzed by the ME panel from January 1 to July 31, 2017. We abstracted demographic, clinical, laboratory, and imaging data to assess ME panel results and their influence on clinical management.

Results. We reviewed the charts of 93 patients aged 21 to 85 who had the ME panel performed. Forty-nine (53%) were males and eight (9%) were immunosuppressed. Eight (9%) patients had a positive test for at least one target pathogen: four for a bacterial target (*S. pneumoniae*, *N. meningitidis*, or *H. influenzae*), three for a viral target (HSV-2 or VZV), and one for both a bacterial and a viral target (*S. pneumoniae* and HSV-2). CSF cultures were negative for all five cases with bacteria detected. Confirmatory uniplex PCR was not performed for the positive viral results. Four of the five patients with positive results for a bacterial pathogen had received broad-spectrum antibiotics prior to lumbar puncture. In all five, antibiotics were modified (either started or de-escalated) based on the pathogen identified on the ME panel. All four patients with a positive result for a viral target received anti-viral therapy—in one case this was started empirically, while in the remaining three treatment was started only after the ME panel had resulted. Antibiotic management in the 85 patients with a negative ME panel varied widely based on clinical suspicion and other laboratory data. Three (3%) of the 93 patients had positive cultures for pathogens that are not ME panel targets (*S. aureus* and *S. hominis*).

Conclusion. The ME panel yielded positive results in cases where conventional tests did not, including when antibiotics had been initiated prior to CSF sampling. While a positive ME panel prompted changes in therapy, negative results, in the majority of cases, did not supersede clinical suspicion.

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341. Characteristics, Risk Factors, and Outcomes of Encephalitis in Older Adults

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Background. Encephalitis is a serious medical condition with adverse clinical outcomes seen in 50% of individuals. Older adults have higher rates of adverse outcomes in community-acquired meningitis but studies in encephalitis are lacking.