103. An Association Between Abnormal CSF Analysis and Inpatient Mortality in Cryptococcal Meningitis, a Tertiary Care Center Experience
Jordan Resnick, MD; Emad A. Chishti, BS; Mahesh Bhatt, MD; Thein Myint, MBBS; Centers for Disease Control and Prevention/Division of Vector-Borne Diseases/Alaska and Canada; Fort Collins, CO; Centers for Disease Control and Prevention, Atlanta, GA

Session: O-22. Neurologic Infections

Background. Cryptococcal meningitis (CM) is a life-threatening condition that requires prompt recognition and management. With high mortality in mind, we elected to compare the key CSF analysis, blood culture and serum cryptococcal antigen (CrAg) to prognosticate the probability of mortality in this population.

Methods. We retrospectively reviewed all charts of patients admitted to our tertiary care center from 10/2005 to 10/2017. Inclusion criteria encompassed patients with positive CSF CrAg, positive CSF cultures, India ink, cytopathology, or CSF cell count >5 with CNS symptoms, positive serum CrAg titer or blood cultures.

Results. Sixty patients who met the inclusion criteria were divided into the survivor (n=41) and the non-survivor (n=19) groups based on the inpatient mortality. There was no difference in age, sex, and immune status between the two groups. The median CSF nucleated cell counts in the non-survivor group was 39 cells/µL with median lymphocyte 59.5% whereas in the survivor group was 72 cells/µL with median lymphocyte 76% (P= 0.001 and 0.04 respectively). The median CSF glucose was 27 mg/dL in the non-survivor compared to 35 mg/dL in the survivor group (P=0.02). Median CSF CrAg was higher at 1:1024 in the non-survivor group whereas the survivor group was 1:256 (P < 0.01). CSF opening pressure (cm H2O), blood culture, and serum CrAg level were not statistically significant between the two groups.

Conclusion. Low CSF cell count, low glucose, and high CSF CrAg were independently associated with inpatient mortality in CM. This is in line with the prior findings. A novel finding in this study is significantly decreased median CSF lymphocyte % in the non-survivor group. Serum CrAg titer, positive blood culture, and median CSF protein were not statistically significant between the two groups. However, a study with a larger sample size may be needed to confirm these findings.

Disclosures. All Authors: no reported disclosures

104. Plague Meningitis - A Systematic Review of Published Cases, Antimicrobial Treatment, and Outcomes
Katharine Cooley, MPH1; Shannon Fleck-Derderian, MPH2; Christina Nelson, MD, MPH3; Centers for Disease Control and Prevention/Division of Vector-Borne Diseases/Alaska and Canada; Fort Collins, CO; Centers for Disease Control and Prevention, Atlanta, GA

Session: O-22. Neurologic Infections

Background. Plague meningitis is a rare but serious manifestation of infection with the bacterium Yersinia pestis. The risk factors, clinical evolution, and optimal treatment strategies of plague meningitis are not well understood, and data is limited to sporadic case reports. To advance knowledge of this condition and support clinical practice recommendations, we conducted a systematic review of published cases of plague meningitis.

Methods. We reviewed PubMed Central, Medline, Embase, and other databases for publications on plague meningitis in any language. Articles that contained reports of patients with plague meningitis plus information on patient outcome were included.

Results. Among 1,009 articles identified in our search, we found 54 articles describing 83 cases eligible for inclusion. Cases occurred between 1898 and 2015; mean age of patients was 20.5 years (range 6 weeks - 64 years) and 65% were male. Most patients lived in the United States (23%), Argentina (18%), Vietnam (12%), and China (12%). Four patients (6%) had primary plague meningitis. More than half (59%) of patients developed meningitis secondary to primary bubonic plague; the remainder developed meningitis secondary to other or unknown forms of plague. Of patients with a bubo, 51% had an axillary bubo. The most common symptoms were fever (66%), rash (43%), and headache (35%); 23 patients had focal neurologic deficits such as cranial nerve abnormality. Case fatality rate was 96% (n=23/24) for patients who did not receive antimicrobial treatment and 42% (n=25/59) for patients treated with antimicrobials. Case fatality rate by antimicrobial received, including patients who received multiple antimicrobial classes, was 70% for sulfonamides (n=38), 30% for fluoroquinolones (n=2), 19% for aminglocyclines (n=21), 11% for chloramphenicol (n=19), and 0% for tetracyclines (n=14).

Conclusion. Plague meningitis has a high fatality rate, but antimicrobial treatment can improve patient outcomes. Having an axillary bubo may be a risk factor for developing plague meningitis — in contrast to our findings, a recent analysis found that only 24% of patients had bubonic plague in their region. Additional research would be helpful to investigate this association further.

Disclosures. All Authors: no reported disclosures

105. Impact of a Multiplex Polymerase Chain Reaction Panel on Duration of Empiric Antimicrobial Therapy in Suspected Bacterial Meningitis
Justin J. Choi, MD; Lars Westblade, PhD; Lee S. Gottesdiener, MD; Kyle Liang, PA-C; Han A. Li, MD; Graham T. Wehmeyer, MD; Marshall J. Glebsy, MD; Matthew Simon, MD, MS; Welll Cornell Medicine of Cornell University; New York, NY; New York-Presbyterian Hospital, New York, New York

Session: O-22. Neurologic Infections

Background. Multiplex polymerase chain reaction (PCR) panels allow for rapid detection or exclusion of pathogens causing community-acquired meningitis and encephalitis (ME). However, the clinical impact of rapid multiplex PCR ME panel results on the duration of empiric antibiotic therapy is not well characterized.

Methods. We performed a retrospective pre-post study to evaluate the implementation of the FilmArray ME panel (BioFire Diagnostics, LLC) for diagnosis of bacterial meningitis at our institution. We included adults who presented with suspected bacterial meningitis, received empiric antibiotic therapy, and underwent cerebrospinal fluid microbiological testing in the inpatient microbiology department. The primary outcome was duration of empiric antibiotic therapy. A bivariate analysis that compared baseline demographics, clinical characteristics, and study outcomes between the pre-ME panel and post-ME panel periods was performed using Mann-Whitney tests, chi-squared tests, or Fisher’s exact tests. Time-to-event analysis used the Kaplan-Meier method and log-rank statistics.

Results. In the pre-ME panel period, the positive detection rate of bacterial pathogens was 2.2% (3/137) by cerebrospinal fluid culture and 4.3% (3/69) in the post-ME panel period. Table 1 shows baseline characteristics of patients. Compared to the post-ME panel period, there were significant reductions in the post-ME panel period for the duration of empiric antibiotic therapy (median 34.7 h, IQR 8.5–61.7, vs. 12.3 h, IQR 3.3–40.0, P < 0.01), time to targeted therapy (59.3 h, IQR 36.5–74.6, vs 70.2 h, IQR 9.9–12.4, P=0.001), and hospital length of stay (4 d, IQR 2–7, vs. 3 d, IQR 1–5, P=0.03), as shown in Table 2. There was also significant reduction in time to discontinuation or de-escalation of empiric antibiotic therapy (P=0.049) as shown in Figure 1.

Table 1. Baseline characteristics for patients with suspected bacterial meningitis

| Characteristic | n (Pre-ME panel) | n (Post-ME panel) | P value |
|---------------|------------------|-------------------|---------|
| Age, median IQR, years | 42 (32–42) | 41 (32–57) | 0.80 |
| Female | 87 (63.5%) | 85 (60.7%) | 0.07 |
| Race | | | |
| White | 62 (45.3%) | 39 (56.5%) | 0.40 |
| Black | 19 (13.9%) | 9 (13.0%) | 0.50 |
| Asian | 8 (5.8%) | 4 (5.8%) | 0.34 |
| Other | 18 (13.1%) | 6 (8.5%) | |
| Not specified | 30 (21.9%) | 10 (14.5%) | |

Comorbidities

| Comorbidity | n (Pre-ME panel) | n (Post-ME panel) | P value |
|-------------|------------------|-------------------|---------|
| Cancer | 11 (8.0%) | 8 (11.6%) | 0.40 |
| Coronary artery disease | 11 (8.0%) | 4 (5.8%) | 0.43 |
| Diabetes mellitus | 19 (13.9%) | 7 (10.1%) | 0.43 |
| Hypertension | 34 (24.8%) | 15 (21.7%) | 0.62 |
| Use of immunosuppressive drugs | 13 (9.5%) | 12 (17.4%) | 0.10 |

Clinical presentation

| Condition | n (Pre-ME panel) | n (Post-ME panel) | P value |
|-----------|------------------|-------------------|---------|
| Fever | 75 (54.7%) | 37 (53.6%) | 0.88 |
| Headache | 84 (63.1%) | 49 (70.1%) | 0.10 |
| Neck stiffness | 46 (33.6%) | 16 (23.2%) | 0.13 |
| Altered mental status | 46 (33.6%) | 24 (34.8%) | 0.86 |
| Seizure | 10 (7.3%) | 2 (2.9%) | 0.34 |

Focal neurologic deficit

| Condition | n (Pre-ME panel) | n (Post-ME panel) | P value |
|-----------|------------------|-------------------|---------|
| Headache | 9 (6.6%) | 6 (8.7%) | 0.58 |
A laboratory confirmed diagnosis of autoimmune encephalitis or viral encephalitis was identified in 36 (12.9%) and 88 (31.5%) cases, respectively. There were 155 cases (55.5%) that had no identifiable cause and were considered idiopathic.

As compared to viral encephalitis, patients with autoimmune encephalitis were more likely to be younger (<60 years old), have a subacute (6-30 days) or chronic (>30 days) presentation, have seizures, and have psychiatric and/or memory complaints (P<0.001). Furthermore, patients with autoimmune encephalitis were less likely to be febrile and to lack inflammatory cerebrospinal fluid (CSF) (defined as white blood cells <50 per microliter or protein <50 milligrams per deciliter) [See Table 1]. In the multivariable logistic regression model, subacute/chronic presentation, psychiatric and/or memory complaints, and lack of inflammatory CSF were significantly associated with autoimmune encephalitis. Using these 3 variables, patients were classified into 3 risk categories for autoimmune encephalitis: low risk (0-1 variables); intermediate risk (2 variables); and high risk (3 variables); 83% (P value <0.001).

Table 1. Results and presenting clinical characteristics

| Antibiotic | OR | 95% CI | P value |
|------------|----|-------|---------|
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |
| belum | | | |