Figure 1. MRI of brain showing nonspecific focus of signal abnormality in the posterior limb of the right internal capsule.

346. Prognostic Factors in Adults with Encephalitis: An Analysis of 340 Cases

Michael Hansen, MD; Mohammed Samannodi, MD; Rodrigo Lopez Castelblanco, MD and Rodrigo Hashun, MD, MPH; 1Family and Community Medicine, Baylor College of Medicine, Houston, Texas, 2Division of Infectious Diseases, University of Texas Health Science Center at Houston, McGovern Medical School, Houston, Texas

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Background. Encephalitis continues to be a significant cause of morbidity and mortality with only a few studies assessing prognostic factors.

Methods. A multicenter retrospective review of adults with encephalitis as defined by the international encephalitis consortium between 2000 and 2017 at 19 hospitals in New Orleans, Louisiana, and Houston, Texas. An adverse clinical outcome was defined as a Glasgow outcome scale between 1 and 4. Logistic regression analysis was used to evaluate prognostic factors.

Results. A total of 340 adults were enrolled. The mean age was 48 years with 184 (51.1%) being male. Out of 340 patients, 268 (79%) had probable or confirmed encephalitis and 71 (21%) had possible encephalitis. An etiology was documented in 151 cases (44.5%) with the most common etiologies being arboviruses (17%), herpes simplex virus (HSV) (16.5%), and anti-N-methyl-D-aspartate receptor antibody (13.4%). An adverse clinical outcome was observed in 172 out of 323 (53%) of patients. On bivariate analysis, age >60 years, respiratory failure, intensive care admission, fever, abnormal neurological examination, abnormal electroencephalogram, and abnormal magnetic resonance imaging (MRI) of the brain were associated with an adverse outcome (P < 0.05). On logistic regression, only abnormal neurological examination (odds ratio [OR] 4.310, 95% confidence interval [CI] 1.148–12.508), abnormal MRI of the brain (OR 4.469, 95% CI 1.016–17.286), and fever (OR 2.127, 95% CI 1.079–4.194) (all P < 0.05) remained independently associated with an adverse outcome.

Conclusion. Encephalitis in adults is associated with adverse clinical outcomes in 50% of patients with significant predictors being fever, abnormal neurological examination, and abnormal MRI of the brain.

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347. Capnocytophaga canimorsus Meningitis: Diagnosis Using Polymerase Chain Reaction Testing and Systematic Review of the Literature

Megan Hansen, MD; Rohit Majumdar, DO and Nancy Cruin-Gianfalone, MD, MPH; Scripps Mercy Hospital, San Diego, California

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Background. Capnocytophaga canimorsus is associated with sepsis following dog bites, especially in asplenic patients. Meningitis is a rare entity and may be associated with delayed diagnosis due to poor or delayed growth. We provide our experience using polymerase chain reaction (PCR) to establish the diagnosis and performed a comprehensive review of C. canimorsus meningitis providing data on clinical manifestations, diagnosis, and outcomes of this unusual infection.

Methods. A systematic review of the peer-reviewed English literature (PubMed, Embase, Ovid Medline) from January 1966 to March 2018 was performed to identify cases of C. canimorsus meningitis in addition to our case. Data collected included demographics, risk factors, cerebrospinal fluid (CSF) findings, PCR testing, treatment, and outcomes. Descriptive statistics are presented as numbers (percentages) and medians (ranges).

Results. A total of 37 cases with a median age of 63.5 years (range 12–83 years) with a male predominance (75%). A relatively low proportion had an immunocompetent state: 17% splenectomy and 6% steroid use. The most common risk factor was alcoholism (19%). Sixty-four percent reported a dog bite (all <10 days prior to presentation); 22% non-bite dog exposure; 3% cat bite; and 11% no animal contact. CSF mean white cells of 1,894 cells/mm³, neutrophils 76% ±19%, protein of 225 mg/ dL, and glucose CSF/serum ratio of 0.24 ±0.15. In 16 (43%) cases, blood cultures were positive for C. canimorsus (median 4.3 days) and 27 (73%) had positive CSF cultures (median 4.4 days). PCR established the diagnosis in seven (19%) cases. Antibiotic therapy was given for a median of 14 days (range 7–42 days). Prognosis was overall favorable with one (3%) mortality; 19% of survivors had sequelae: four learning loss, one headaches, two neurological deficits, and two with extremity amputations.

Conclusion. C. canimorsus meningitis is a rare clinical entity occurring in patients of all ages typically after dog exposure. While classically considered a disease of immunocompromised patients, most cases occurred in previously healthy, immunocompetent persons. Diagnosis may be established by PCR and testing should be considered in culture-negative cases with associated risk factors. Outcome was generally favorable after a median antibiotic duration of 14 days.

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348. Streptococcus agalactiae, Streptococcus pneumoniae, Neisseria meningitidis, and Enterobacteriaceae as Leading Causes of Bacterial Meningitis in Infants Younger than 3 Months Old in a Mexican Hospital: 6 Years of Active Surveillance

Enrique Chacón-Cruz, MD; Efiri Zee Lopatynsky-Reyes, MD; Lucia Alejandra Almada-Salazar, MD; Rosa Maria Rivas-Landeros, PhD; Maria Luisa Volker, PhD; Jorge Arruto Alviais-Palacios, MD, PhD; 1Department of Pediatrics, Hospital General de Tijuana, Tijuana, Baja California, Mexico, 2School of Public Health, University of California-San Diego, San Diego, California, 3School of Medicine, Universidad Autonoma de Baja California, ECISALUD, Tijuana, Mexico, 4Department of Microbiology, Hospital General de Tijuana, Tijuana, Baja California, Mexico

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Background. In Mexico, several publications have mentioned that Enterobacteriaceae are the main causes of bacterial meningitis (BM) in young infants (<3 months), with S. agalactiae (GBS) and other bacteria present in a much lesser extent; however, these studies have been performed mostly at Mexico City, and little is known on the northwest Mexico/US Border, particularly at Tijuana, Mexico (the highest transited frontier in the planet).

Methods. Since January 1, 2012 until December 31, 2017 (6 years) we underwent active/prospective surveillance to identify all causes of non-nosocomial–acquired BM in infants <3 months old at the Tijuana General Hospital, Mexico. Bacterial identification was performed either by cultures or PCR, pneumococcal serotyping by the Quellung Reaction (Statens Serum Institute ) or PCR, and meningococcal serogrouping using the Pastorex- Agglutination Meningitis kit (Alere, Ltd.), Demographic, clinical, laboratory, and microbiological data were saved, and statistical analysis was merely descriptive.

Results. In 6 years, 20 BM cases (3.33 per year) were identified, among which 16 (80%) were newborns <1 month old. GBS was the leading cause (7 = 35%), followed by S. pneumoniae (4 = 20%, serotypes 19A, 33C, 18B, and 12), N. meningitidis (3 = 15%, serogroups C, Y, and B), Enterobacteriaceae (3 = 15%, E. coli, E. cloacae, P. mirabilis), N. gonorrhoeae (2 = 10%) and L. monocytogenes (1 = 5%), see Figure 1. Overall lethality was of five (25%). Highest mortality was found in newborns <7 days old (66.6%), and BM caused by Enterobacteriaceae (66.6%). Among survivors, seven (35%) developed sequelae 3 months following discharge.

Conclusion. Etiology of BM in young infants in Tijuana differs from Mexico City, with GBS, S. pneumoniae, N. meningitidis as leading causes, along with Enterobacteriaceae. BM in young infants is associated with high mortality and morbidity, especially in newborns and those caused by Enterobacteriaceae. Preventive measures, such as mother screening for GBS carriage/penicillin prophylaxis, as well as early vaccination vs. S. pneumoniae and N. meningitidis should be considered based on further results obtained from this active surveillance in the future.

Fig - 1

CASES (%)

GBS S. pneumoniae N. meningitidis Enterobacteriaceae N. gonorrhoeae L. monocytogenes

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349. Retrospective Descriptive Analysis of West Nile Neuroinvasive Disease in Northwest Louisiana
Pradeep Mada, MD,1 Philip Sneed, MD,2 Gabriel Castano, MD,3 Maureen Moore, Co-ordinator1 and Andrew Stevenson Joel Sneed, MD,4 Infectious Diseases,3 Neuroinvasive Diseases,4 Infectious Diseases, Louisiana State University Health Science Center, Shreveport, Louisiana, Louisiana State University Health Sciences Center - Shreveport, Shreveport, Louisiana, Pediatrics, University of Texas Health Science Center at San Antonio, San Antonio, Texas,1 Infectious Diseases, Louisiana State University Health Sciences Center - Shreveport, Shreveport, Louisiana

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Background. West Nile virus (WNV) infection has become endemic in the continental United States. Eighty percent of the West Nile virus infections are asymptomatic. One in 150 individuals with West Nile virus infection develops West Nile neuroinvasive disease (WNND). The neurological manifestations include encephalitis, meningoencephalitis, meningitis, and acute flaccid paralysis.

Methods. We performed a retrospective descriptive study in our tertiary care hospital in Louisiana to describe the clinical features, Cerebrospinal fluid (CSF) findings and clinical outcomes. Patients aged >18 years admitted in our hospital between January 1, 2012 and December 31, 2017 were included. Hospital Electronic Health records were screened for diagnosis of WNND by ICD codes and positive WNV antibody testing in CSF.

Results. There were a total of 23 patients identified with positive WNV IgM or IgG in CSF. Fifteen patients were males and eight were female. The median age was 48.8 years. Six patients were diagnosed with meningitis, 12 with encephalitis, and five with meningoencephalitis. Most Common presenting symptoms were altered mental status and fever in 15 patients. Only two patients gave history of mosquito bite. Incidence peak was in the month of August, July, and September.

WNV IgG and IgM antibodies were positive in CSF in 13 patients. Four patients had only positive WNV IgM and six patients had only positive WNV IgG. The average number of days from the admission to diagnosis of infection ranged from 3 to 16 days with average of 8.9 days. CSF protein was >45 mg/dL in 12 patients and elevated white cell count (>5 mm3) in 20 patients. CSF protein >100 mg/dL was seen in nine patients. Lymphocytosis was present in 10 patients. The average length of stay was 13.3 days and nine patients required ICU stay. Only one patient was not given any antibiotics. The average duration of antibiotics was 6.4 days. On 1 year follow-up, eight patients had no residual deficits, four patients had residual deficits, two patients were deceased, and nine patients were lost to follow-up.

Conclusion. WNV infection has become endemic in Southern United States especially in summer months. Identifying the infection early in its clinical course would help to avoid unnecessary antibiotics when patients present with fever and meningeval symptoms. Including WNV antibodies in CSF studies is critical in making a diagnosis.

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350. Epidemiology of Bacterial Meningitis in Pediatric Population After the Introduction of Pneumococcal Conjugated Vaccine in Costa Rica
Carly Barboza, MD1; Helena Benez, MD,2 Maria L. Avila-Aguero, MD;1 Lydiana Avila, MD3 and Katta Camacho, MD2; Pediatric Residency Program, Hospital Nacional de Niños “Dr. Carlos Sáenz Herrera,” San Jose, Costa Rica, 2Pediatric Infectious Diseases Department, Hospital Nacional de Niños “Dr. Carlos Sáenz Herrera,” San Jose, Costa Rica, 3Head of the Medical Department, Hospital Nacional de Niños “Dr. Carlos Sáenz Herrera,” San Jose, Costa Rica

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Background. In Costa Rica (CR), bacterial meningitis (BM) is an important cause of morbimortality in the pediatric population. Pneumococcal meningitis was the leading cause of BM before 2009. PCV7 was introduced in the National Immunization Schedule (NIS) in 2009 (3 + 1 schedule) and then changed to PCV13 (2 + 1 schedule) in 2012. Our objective was to describe the epidemiology, bacteriology, clinical findings, and complications in patients with BM admitted to the only tertiary pediatric hospital in CR and compare these findings with the epidemiology of the pre-PCV era.

Methods. Retrospective, descriptive study of patients hospitalized with BM from January 2009 to December 2015. We described the first epidemiological study of BM after the introduction of PCV in NIS in CR.

Results. Seventy-six patients were enrolled. Forty-nine patients (64.5%) were male and the median age at admission was 18 months; 63 patients (82.8%) under 24 months of age, but 20 patients (31.7%) were under 2 months of age. Mean length of stay was 19.3 days (range 16.07–22.59). Only 13.2% patients had at least one PCV dose. S. pneumoniae was isolated in 21/76 (27.6%), followed by S. agalactiae in 20/76 (26.3%) and E. coli 13/76 (17.1%). N. meningitidis was not isolated during the study period. Only 9/21 pneumococcal isolates were typed: vaccine serotypes 5, 6B, 7E; and 14 were found in 3/9 patients (33.3%) and in 1/9 patients (11.1%) each, respectively; non-vaccine serotypes 9N, 10A, 11A, and 14 were found in 1/9 patients each. PCV7 pneumococcal isolates were penicillin susceptible. Complications were documented in 24/76 patients (31.6%), been hypoxia and neurological disabilities the most common. Mortality was documented in 4/76 (5.3%). The incidence of BM in the post-PCV era was dramatically reduced in comparison with the pre-PCV era, with a 54.7% reduction of all causes of BM and a 46.7% reduction in pneumococcal meningitis. Latality due to pneumococcal meningitis was also reduced from 20% to 14.3%.

Conclusion. In CR, BM is an important cause of high morbidity. Pneumococcal meningitis is still the leading cause of BM in our pediatric population, but a dramatic reduction in pneumococcal meningitis was observed after the introduction of PCV’s in our NIS. Mortality was lower than what is reported in industrialized countries.

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351. Is It Not Always Tuberculosis: Cytomegalovirus Polyradiculopathy and Encephalitis in Two Filipino Men With Advanced HIV Infection
Rene Carlos Valencia, MD3; Alejandro, MD2; Maria Sonia Salamat, MD3; Section of Infectious Diseases, University of the Philippines-Philippine General Hospital, Manila, Philippines

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Background. Polycydradiculopathy (PRP) and encephalitis are neurologic syndromes associated with 1% of cytomegalovirus (CMV) disease among patients with advanced HIV infection. Untreated patients die within 8 weeks. This case series and literature review highlights the clinical and laboratory features integral to the prompt diagnosis and treatment of these rare but serious manifestations of CMV disease among AIDS patients.

Methods. We document CMV PRP and encephalitis in two HIV-seropositive men seen in a tertiary hospital in the Philippines. Both patients presented with bilateral leg weakness, paresthesias, hyporeflexia, and urinary retention associated with confusion and memory lapses. In the two cases described, diagnosis of CMV disease was delayed because it was not immediately entertained. Tuberculosis involving the nervous system was first ruled out.

Results. The first case was a 31-year-old male with a baseline CD4 count of 9 cells/mm3 who presented with signs and symptoms of bilateral leg weakness and parasthesias 3 weeks after initiation of antiretrovirals (ART). CMV viremia was detected by PCR. Ganciclovir was initiated late, and he subsequently died of multiorgan failure. The second case is a 29-year-old male with a baseline CD4 count of 2 cells/mm3 CMV DNA PCR was detected in the CSF. He died prior to initiation of anti-CMV therapy.

Conclusion. CMV-related neurologic complications are uncommon, but often fatal when appropriate anti-CMV therapy is not initiated promptly. The diagnosis of