mismatch is a well-known risk factor of post-transplant (Tx) CMV reactivation. Recent laboratory advances for evaluating HLA mismatch can measure existence of donor-specific antibodies for single HLA allele; however, there was little evidence whether single panel reactive Ab (PRA) assay could predict CMV reactivation in SOT recipients.

Methods. We retrospectively analyzed pre-Tx HLA mismatch tests in total 300 of SOT recipients. All of them were CMV seropositive in donor and recipients and received regular blood CMV VL monitoring during ≥6 months after SOT. Lung (N = 83) and heart (N = 76) recipients received universal prophylaxis for 3 months, and kidney (N = 63) and liver (N = 78) received pre-emptive CMV therapy. The single PRA test for HLA class I/II was performed by bead-based immunoassay. The percentage of PRA was calculated by following formula: (the number of positive bead reaction/the number of beads in the assay) × 100. We categorized HLA-Ab specificity into two groups according to median fluorescent intensity (MFI) of bead; (1) strong with ≥10,000 of MFI, (2) not strong with <10,000. The calculated PRA was obtained from the frequency of HLA alleles in normal Korean population according to formula from U.S. Organ Procurement and Transplantation Network.

Results. The reactivator with ever ≥500 IU/mL of CMV had significantly higher positive percentage of HLA Class I screening test compared than nonreactivator (33.8% vs. 11.6%, P = 0.004) but not class II (P = 0.085). The PRA and cPRA values only for HLA class I were significantly lower in nonreactivator (PRA, 0 [0–0] % vs. 0 [0–15] %, P = 0.005; cPRA, 0.5 [0–15.5] % vs. 4.5 [0–41.5] %, P = 0.030), but not class II (PRA, P = 0.393, cPRA, P = 0.446). The percentage of strong MFI group for class I in nonreactivator was significantly lower than those in reactivator (7.1% vs. 28.8%, P = 0.028), but not class II (11.6% vs. 15.8%, P = 0.512). The maximal levels of CMV VL did not have any significant correlation to MFI values of Class I nor II.

Conclusion. Seropositive SOT recipients with strong PRA or cPRA values for HLA Class I in pre-Tx single PRA test had higher risk of CMV replication.

Disclosures. **All authors:** No reported disclosures.

2080. Impact of the Implementation of a Rapid Meningitis/Encephalitis Multiplex Polymerase Chain Reaction Panel on Clinical Outcomes: Multicenter, Retrospective Cohort of Adult and Pediatric Patients

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Session: 233. Diagnostics: Virology

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Background. Meningoencephalitis has a high mortality rate, therefore rapid identification of the underlying etiology is essential to optimize clinical and stewardship outcomes. The standard for diagnosis of meningoencephalitis included cerebrospinal fluid (CSF) culture and viral polymerase chain reaction (PCR) until approval of the BioFire® Meningitis/Encephalitis (ME) panel, a multiplex PCR panel for the rapid detection of 14 central nervous system pathogens. The objective of this study was to determine the impact on clinical outcomes of the newly adopted ME panel in a central laboratory as compared with previously utilized CSF studies within a large, multicenter health system

Methods. This is a multicenter, retrospective cohort study of adult and pediatric patients who received at least one dose of intravenous (IV) acyclovir for presumed meningoencephalitis, with study patients divided into pre-ME and post-ME panel cohorts. The primary endpoint is duration of IV acyclovir. Secondary endpoints include duration of antibacterials, in-hospital mortality, intensive care unit length of stay (LOS), hospital LOS, rates of acute kidney injury and test-turnaround time (TAT). Subgroup analyses were performed analyzing the impact of number of daily couriers and distance from the central laboratory on TAT.

Results. A total of 208 patients were included: 87 pediatric and 121 adult. The duration of IV acyclovir decreased after implementation of the ME panel (41.6 vs. 30.8 hours; P < 0.01). The TAT was reduced with the implementation of the ME panel (37.3 vs. 6.2 hours; P < 0.01). There were no significant differences in the remaining secondary outcomes. Subgroup analyses of the post-ME cohort showed that the number of daily couriers to the central laboratory and the distance from the central laboratory significantly impacted TAT (P < 0.01) but not duration of IV acyclovir.

Conclusion. The ME panel significantly reduced the duration of IV acyclovir and TAT, which could have cost and safety implications when applied to a larger patient population. Multicenter healthcare systems implementing the ME panel may consider on-site ME platforms at multiple sites due to the significant effect of a central laboratory on TAT.

Figure 1. Primary Outcome Data

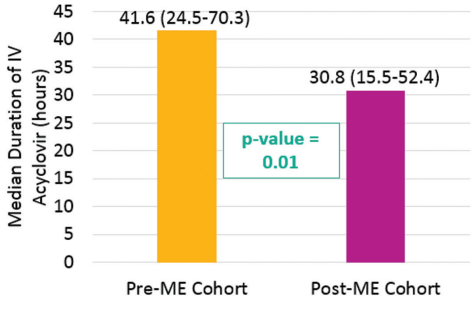


Figure 2. Subgroup Analysis of Post-ME Cohort: Median TAT in hours by number of daily courier trips to the central laboratory (IQR)*

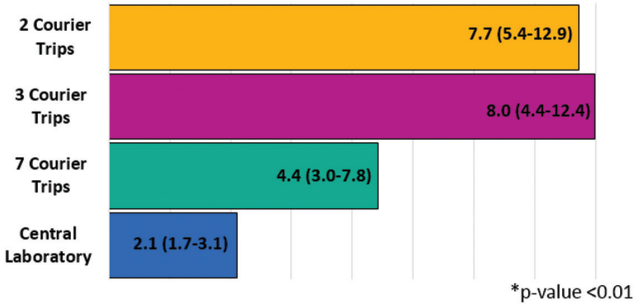
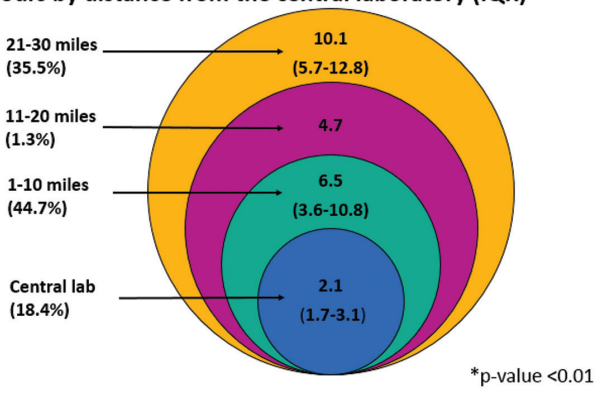


Figure 3. Subgroup Analysis of Post-ME Cohort: Median TAT in hours by distance from the central laboratory (IQR)*



Disclosures. **All authors:** No reported disclosures.

2081. Building a Decision Tree with Serial Serology Measurements Improves Classification in a Flavivirus Co-circulation Region

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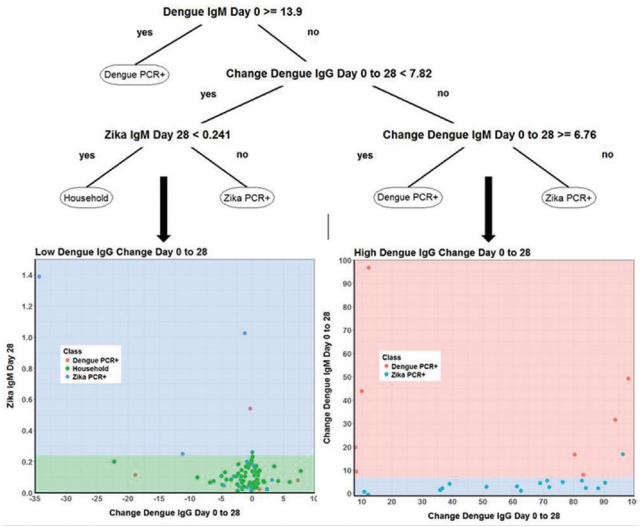
Background. RT-PCR (reverse transcriptase polymerase chain reaction) is often considered the "gold standard" for diagnosis of Zika Virus (ZIKV) infection; however, it has been shown to have low sensitivity. A possible remedy is to study ZIKV-specific IgG (ZsIgG) and IgM (ZsIgM) antibodies. However, the *in vitro* cross-reactivities of Dengue virus (DENV) and ZIKV-specific antibodies are well known, leading to diagnostic difficulties in an area with co-circulation of the two viruses. Our goal was to use Zika and Dengue serologic assays to build a classification model that improves upon the PPV of commercial kits while maintaining sensitivity.

Methods. We conducted a prospective longitudinal study in Southern Mexico where DENV and ZIKV co-circulation occurs (*NCT02831699*). Patients were included in two cohorts: a cohort of subjects presenting with a febrile rash meeting WHO/PAHO Zika case definition and a household cohort. After signed consent, all subjects enrolled were evaluated on study-visit Days 0, 3 and 7 (for fever rash cohort) and 28. We considered a subject "true positive" for ZIKV or DENV if RT-PCR positive at any time point. The healthy household cohort (with no positive RT-PCR) was considered "true

negatives." We fit a statistical decision tree taking as inputs serial serology measurements and outputting a predicted disease category. Funded in part by the NCI Contract No. HHSN261200800001E. Funded in part by the Mexican Ministry of Health.

Results. As of March 2018, we have 32 subjects in the Zika PCR+ group, 32 in the Dengue PCR+ group, and 68 in the household group. Our decision tree (Figure 1) achieved PPV of at least 90% on all three disease categories, while maintaining sensitivity above 50%. The highest PPV achieved by the kit manufacturer recommended cutoffs while maintaining a sensitivity of at least 10% on Zika PCR+ subjects is 30/114 (26%), and for Dengue PCR+ subjects is 21/30 (70%).

Conclusion. Using serology data in a statistical decision tree improves the PPV exhibited by the kit manufacturer recommendations while still maintaining respectable sensitivity. Physicians in regions with co-circulating flaviviruses should be aware of the pitfalls of using only RT-PCR or using pre-established commercial cutoffs in the serology kits for diagnosis.



Disclosures. **All authors:** No reported disclosures.

2082. Using a Commercially Available Assay Measuring Cytomegalovirus (CMV)-Specific CD4+ and CD8+ T-Cell Immunity by Intracellular Cytokine Staining to Predict Clinically Significant CMV Events

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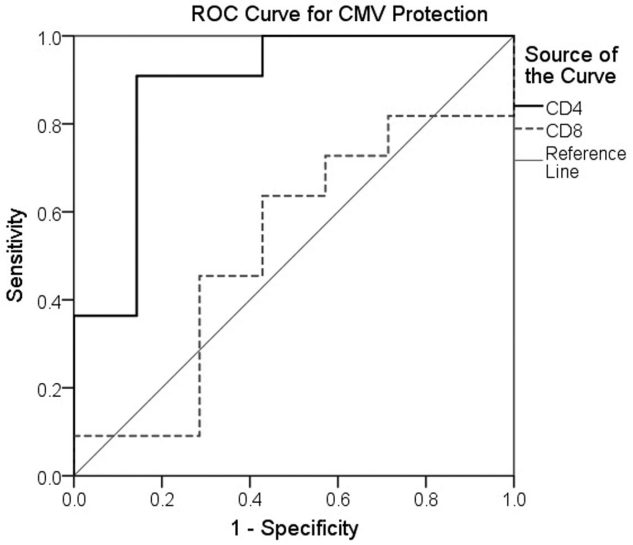
Background. Cytomegalovirus (CMV) infection is a common opportunistic infection associated with significant morbidity, mortality, and risk of allograft loss. Early detection of viremia and initiation of treatment prior to disease progression is paramount. Alternatively, in the absence of treatment, many patients also control CMV infection, including low-level viremia, without progressing to disease. Thus, many treatment decisions (e.g., viremia thresholds to initiate treatment) are not currently well-defined. Given the excessive toxicities and costs of antiviral therapy, there is growing interest in assays that measure CMV-specific T-cell immunity (TCI), which may predict protection against infection. The Viracor® CMV T-cell Immunity Panel (CMV-TCIP) uses flow cytometry and intracellular cytokine staining (ICS) to measure % of CMV-specific CD4+ and CD8+ T-cells. Other currently available TCI commercial assays measure only aggregate (CD4+ and CD8+) or CD8+ immune responses only.

Methods. We included patients who had CMV-TCIP results at Rhode Island Hospital (January 2016–February 2018) and who subsequently had at least one additional assessment for CMV viremia. CMV events were defined as rising viremia prompting initiation of treatment and were captured after the most recent CMV-TCIP result. We built CMV-protection relative-operating curves (ROC) for % of CD4+ and CD8+ CMV-specific T-cells.

Results. We analyzed 17 samples from 13 patients: 10 were SOT (eight kidney, two heart) recipients (seven CMV R+, three D+/R–); two had hematologic malignancies; one other was immunosuppressed (prednisone, infliximab) for autoimmune colitis. Four additional samples were excluded because of CD4+ or CD8+ ICS background positivity. The CMV-protection ROC AUC was significant for % of CMV-specific CD4+ but not CD8+ T-cells (Figure 1). At a cut-off of 0.26% CMV-specific CD4+ T-cells, PPV was 90% (95% CI 71–100%), and NPV was 86% (95% CI 60–100%). In 14 of 17 cases (82%), the CMV-TCIP result was useful in guiding management.

Conclusion. In this small, single-center, heterogeneous series, the % of CMV-specific CD4+ T-cells measured by ICS was predictive of protection against CMV. The CMV-TCIP can be a useful, cost-effective test, and merits further validation in larger prospective studies.



Variable	AUC	SE[a]	P-value[b]	95% CI	
				Lower Bound	Upper Bound
CD4	.883	.092	.008	.703	1.000
CD8	.519	.147	.892	.232	.807

a. Standard error under the nonparametric assumption

b. Null hypothesis: true area = 0.5

Figure 1.

Disclosures. **D. Farmakiotis**, Viracor: Consultant and Invited speaker, Consulting fee.

2083. Rapid Diagnosis and Differentiation of Dengue During Peri-monsoon Season in Tropical Resource Limited Facilities

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Background. Dengue is a re-emerging public health problem threatening the tropical developing world, mandating rapid diagnosis and supportive management in the absence of licensed vaccines or anti-dengue therapy. Regions endemic for dengue and related viruses are overwhelmed by the sudden surge of cases during outbreaks. It is difficult to justify confirmatory diagnosis of every case using WHO criteria or differentiate it from other concurrent viral illnesses. The study evaluated a rapid, sensitive and specific diagnostic methodology suitable for dengue outbreaks in resource limited facilities.

Methods. One hundred dengue patients as per WHO Criteria as well as 100 healthy controls from New Delhi, India were included. Samples collected on fifth day on onset of fever were tested by lateral flow immunochromatography (LF-ICT), IgM ELISA and reverse transcriptase polymerase chain reaction (RT-PCR), and results were compared. Diagnostic accuracy indices and Kappa analysis were calculated.

Results. The sensitivity, specificity, positive and negative predictive values (PPV and NPV) of NS1 against RT-PCR was 98.31, 100, 100, and 99.3% and strength of agreement was perfect.

Conclusion. Antigen-based and molecular tests are a better tool for early diagnosis of dengue. The combined LF-ICT kits are highly sensitive, specific, user-friendly, compact, frugal and thus recommended for use in dengue outbreaks, field conditions and as bed side diagnostic tests, for confirmatory dengue diagnosis. Further studies are required to assess their utility in prognosis, surveillance and establishment of guidelines for dengue outbreaks.

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2084. Prospective, Multi-Center Analysis of a BioFire® FilmArray® Childhood Systemic Infection (CSI) Panel for Detection of Viral Bloodstream Infections in a Pediatric Emergency Department Setting

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