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 26 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-empive 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 reactions / 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. All 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 nonreactor (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 nonreactor (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 nonreactor 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 = 0.312). 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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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 meningocoecephalitis includes 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 meningocoecephalitis, 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 antibiotics, 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.

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 (ZdIgG) and IgM (ZdIgM) 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 negative”.

Disclosures. No reported disclosures.
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 assays use serology kits for diagnosis.

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 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.

Disclosures. All authors: No reported disclosures.