90. Fecal Microbiota Transplantation in Metastatic Melanoma Patients Resistant to Anti-PD-1 Treatment
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Background. Most metastatic melanoma patients treated with Programmed cell Death (PD)-1 blockers fail to achieve a durable response. The gut microbiota profoundly affects host immunity, and fecal microbiota transplantations (FMT) have been shown to enhance anti-PD-1 effectiveness in murine models. We report initial safety and efficacy results from the first patients treated in a Phase I study of FMT and re-induction anti-PD-1 therapy in anti-PD-1 refractory metastatic melanoma.

Methods. FMT donors were two metastatic melanoma patients who achieved a durable complete response to treatment. FMT recipients were metastatic melanoma patients who failed at least one anti-PD-1 line of treatment. FMT was conducted by both colonoscopic and oral administration, followed by anti-PD-1 re-treatment. Each recipient underwent pre- and post-treatment stool sampling, tissue biopsy of both gut and tumor, and total body imaging.

Results. Five patients with treatment-resistant metastatic melanoma were recruited. No FMT-related or immunotherapy-related adverse events were observed. To assess engraftment of the new microbiota, recipients were paired with their respective donors and stool 16S rDNA gene sequence analysis was performed. Sequencing results demonstrated post-FMT compositional dissimilarity (Unweighted UniFrac, P = 0.04) and FDR q < 0.22) between the two recipient-donor groups. Specific taxonomic dynamics included post-FMT increased abundance of Paraprevotellaaceae, previously associated in descriptive studies with responsiveness to treatment, and significant reductions in abundance of β-proteobacteria, previously associated with reduced response to treatment. Immunohistochemical stains of biopsies demonstrated an increase in post-FMT infiltration of antigen presenting cells (CD68+) in the gut (paired T-test, P = 0.008) and in the tumor (P = 0.0076). Post-treatment intra-tumoral CD8+ T-cell infiltration was also increased. Three patients had a partial or complete response to treatment post-FMT.

Conclusion. FMT in metastatic melanoma patients seems to be safe and may alter recipient gut microbiota to resemble that of a responder donor. This alteration may result in intra-tumoral T-cell activity, and conferred clinical and radiological benefits in several recipients previously unresponsive to treatment.

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91. Differential Impact of Cytomegalovirus (CMV) Donor (D) Serostatus on Rates and Kinetics of CMV Viremia among CMV Seropositive Recipients (R+) of Ex vivo T-cell Depleted (TCD) and Unmodified (CONV) Hematopoietic Cell Transplants (HCT)
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Background. In unmodified (CONV) HCT, CMV donor seropositivity (D+) conveys partial protection against CMV disease mediated by the transfer of donor T-cell immunity through the allograft. Ex vivo T-cell depletion by CD34 selection affords a stringent depletion of donor T-cells, thus transfer of donor T-cell immunity to CMV would be negligible. We evaluate the impact of CMV D serostatus on rates and kinetics of CMV viremia by Day (D)100 post-HCT in a contemporary cohort of HCT and TCD recipients from a single center.

Active cohort study of R+ adult recipients of first peripheral blood or marrow HCT for hematologic malignancies (excluding multiple myeloma), from June 2010 to December 2017 at MSKCC. Routine CMV monitoring by a quantitative PCR assay occurred weekly from D14 through D100. Patients were treated preemptively. CMV viral burden was assessed as the time-averaged area under the virome curve over 100 days from HCT (AAUC) calculated as the sum of the area of trapezoids of AUC viral loads divided by the number of weeks of follow-up viremia. The median AAUC for all patients with CMV reactivation (AAUC50) was used to classify patients as CMV controllers (AAUC ≤ AAUC50) or noncontrollers (AAUC > AAUC50).

Results. Of 509 R+, 290 (57%) patients received CONV and 219 (43%) TCD HCT; from 630 (59%) D+ and 209 (41%) D− donors. In CONV, CMV viremia occurred with median frequency of D+ (65%) and D− (63%); P = 0.6. In contrast, in TCD, CMV viremia occurred more frequently in D+ compared with D− (83% vs. 71%, P = 0.03). Among CONV, D+ was associated with lower CMV burden (median AAUC) compared with D− (0.79 vs. 1.13, respectively, P = 0.0004). In contrast, in TCD, AAUC was similar between D+ and D− (1.19 vs. 1.35, P = 0.86). Among CONV with CMV viremia, D+ were more likely to have noncontrollers compared with D− (56% vs. 31%, respectively, P = 0.001). In contrast, among TCD with CMV viremia the proportion of noncontrollers was similar between D− and D+ (61% vs. 60%, respectively, P = 1).

Conclusion. Donor CMV serostatus has a differential effect on rates and kinetics of CMV viremia in R+ TCD and CONV HCT recipients. D+ is associated with less CMV viremia and less CMV burden in CONV but not in TCD. Our findings, if confirmed, have implications for donor selection algorithms.

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92. Incidence of Respiratory Syncytial Virus Infection among Hospitalized Adults, 2017–2019
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Background. Respiratory syncytial virus (RSV) infection has been increasingly recognized as an important cause of acute respiratory illness (ARI) and a trigger for exacerbation of underlying cardiopulmonary disease in adults. Incidence of hospitalized RSV infection remains uncertain as adults have not been systematically screened.
Previous incidence estimates, derived primarily from modeling studies, have ranged from 84 to 190/100K population in adults >65 years of age. Accurate burden data are critical to inform RSV vaccine development for adults. We used active surveillance among hospitalized adults to determine population-based incidence rates of RSV infection.

Methods. Hospitalized adults ≥18 years old residing in the surveillance area with ≥2 ARI symptoms or exacerbation of underlying cardiopulmonary disease were screened for eligibility during October 2017–April 2018 and October 2018 to April 2019 in 3 hospitals in Rochester, NY and New York City. Respiratory specimens were collected by RSV using PCR assays. RSV incidence was calculated based on 100,000 persons (per 2010 US Census data) was adjusted by percent market share for study hospitals in their catchment area.

Results. In total, 8,217 hospitalized adults residing in the surveillance area that met the surveillance case definition were tested for RSV, 768 (9.4%) were positive. Adults were aged 18–49 (12%), 50–64 (30%), and 265 years old (58%); 55% were female. RSV infection incidence varied from year 1 to year 2 and was highest in patients aged 263 years old (table).

Conclusion. This is the largest prospective RSV incidence study to date. Preliminary results indicate that the incidence of RSV infection may be higher than previously reported, especially in urban-dwelling adults >65 years of age. Results confirm the need for vaccines to prevent RSV infections in older adults.

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93. Trends in the Laboratory Detection of Rotavirus before and After Implementation of Routine Rotavirus Vaccination: the United States, 2000–2018
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Background. The implementation of rotavirus vaccine has dramatically reduced the disease burden in the United States, CDC analyzed national laboratory testing data for rotavirus from laboratories participating in CDC’s National Rotavirus and Enteric Viruses Surveillance System (NREVSS) during the pre- (2000–2006) and post-vaccine (2007–2018) periods.

Results. Nationally, the median annual percentage of positive rotavirus tests declined from 25.6% (range: 25.2–29.4%) in the pre-vaccine era to 6.1% (range: 2.6–11.1%) in the post-vaccine period. When comparing the pre- and post-vaccine era, the annual peak in rotavirus positivity declined from a median of 43.1% (range: 43.8–56.3%) to a median of 14.6% (range: 4.8–27.3%) while the season duration was reduced from a median of 26 weeks (range: 23–27 weeks) to 9 weeks (range: 0–18 weeks). In the post-vaccine period, a biennial pattern emerged with alternating years of low and high rotavirus activity.

Conclusion. The implementation of rotavirus vaccine has dramatically reduced the disease burden and altered seasonal patterns of rotavirus in the United States; these changes have been sustained over 11 post-vaccine introduction seasons.

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94. Pneumonia Severity Scores Poorly Predict Severe Outcomes Among Adults Hospitalized with Influenza
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95. Impact of Influenza-Like Illnesses on Academic and Work Performance on a College Campus
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Session: 34. Viral Infections - Host, Pathogen, and Impact of Intervention
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Background. Influenza-like illnesses are estimated to cause 500,000 hospitalizations and 50,000 deaths each year in the United States. The high-contact environment of a college campus makes students, faculty, and staff especially prone to respiratory illness, but the impact of these illnesses on academic and work performance is not well understood.

Methods. Between January 14 and April 3, 2019, the Seattle Flu Study enrolled participants with respiratory symptoms throughout the Seattle metropolitan area, including the University of Washington’s main campus. Individuals with at least two self-reported respiratory symptoms in the previous 7 days were eligible to enroll. Participants completed a questionnaire with questions about their medical history, current illness episode, and other behavioral characteristics; a corresponding mid-nasal swab was also collected. Influenza-like illness (ILI) was defined as self-reported fever with a cough and/or sore throat. Laboratory results are pending. Logistic regression was used to assess the association between ILI and work and academic outcomes, including missing class, missing work, performing poorly on an assignment or examination, and experiencing high interference on daily life.

Results. A total of 497 participants enrolled at the University of Washington. Participants had a median age of 22, and 61% were female. Of those with self-reported ILI, 27% reported smoking, 22% had traveled out of state, and 14% had traveled internationally in the month before enrollment. These characteristics did not differ between