Conclusions. Plasma mcfDNA NGS offers a rapid, non-invasive means of detecting a broad diversity of invasive pathogens that overlap in their clinical presentations and are difficult to identify in immunocompromised children. The rapid turnaround time, non-invasive sampling and 1-sample-1000+test-solution may lead to a faster time to pathogen diagnosis, faster time to targeted therapy and obviate the need for invasive diagnostic procedures. The ability with a single test to concomitantly diagnose co-pathogens including reactivating herpesviruses that modulate the progression of principal infecting fungal pathogens (i.e. cytomegalovirus modulation of PJP) can help optimize care. Additionally, this convenient non-invasive means of serial testing of invasive fungal infections may serve as an indicator of burden of infection, provide insight into treatment efficacy and ultimately help define the length and mode (medical/surgical) of therapy required to improve outcomes. Additional studies correlating the mcfDNA signal with individual patient clinical and radiographic parameters will be important to further define the utility of serial mcfDNA monitoring.

#50: Cytomegalovirus Retinitis Among Pediatric Hematopoietic Stem Cell and Solid Organ Transplantation Recipients: A Contemporary Review

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Background. Cytomegalovirus infection can cause significant morbidity and mortality after transplantation. Cytomegalovirus retinitis (CMVR) can be a major complication of tissue invasive CMV disease in transplant recipients. There are little data regarding the contemporary incidence and outcomes of CMVR among pediatric transplant recipients.

Methods. We performed a retrospective cohort analysis of allogeneic hematopoietic (allo-HCT) and solid organ transplant (SOT) recipients who received medical care at Nationwide Children's Hospital (NCH) from 1/1/10–11/30/20 and had a diagnosis of CMVR to describe the incidence, timing post-transplant, ocular manifestations, management, and outcomes. Basic demographic and clinical data, pre-transplant donor/recipient CMV serostatus, and post-transplant CMV infection data were collected. Graft-specific CMV surveillance and prophylaxis strategies were performed according to NCH hospital guidelines. During the study period, quantitative plasma CMV PCR assays included copies/mL (2010–2013) and WHO international standard IU/mL (2013–2020).

Results. During the 10-year study period, 347 patients underwent allo-HCT (N=214) or SOT (N=133; heart N=46, liver N=36, kidney N= 52; 1 patient had concomitant kidney and liver transplantation); median age was 8.6 years [range 0.1–25.9] and 198 (56.5%) were male. In total, 98 patients had CMV DNAemia post-transplant, and CMVR was diagnosed in 3 (HCT=2, SOT=1), for an overall CMVR incidence of 0.86% among all transplant recipients and occurring in 3% of patients with CMV DNAemia. No CMVR was diagnosed in patients without CMV DNAemia. An ophthalmologic examination was performed in 58 (59%) of patients with any DNAemia compared with 67 (27%) of patients without DNAemia.

CMVR was diagnosed on funduscopic examination a median of 183 days [range 34–512] post-transplant based on visual symptomatology (N=2) or by routine eye screening prompted by DNAemia (N=1). CMV DNAemia at the time of CMVR was 1,463 copies/mL, 3,000, and 14,204 IU/mL; all patients had prolonged (>3 months) CMV detection before CMVR. One SOT recipient had concomitant pathology confirming CMV gastrointestinal tract disease. Two of the 3 CMVR cases occurred in the setting of genotypic UL94 CMV resistance mutations (A594V, H520Q)(Figure 1). Two patients were already receiving CMV antiviral therapy (maribavir N=1; valganciclovir=1) at the time of CMVR diagnosis. After the CMVR diagnosis, all patients were prescribed systemic foscarnet. Adjunctive therapies included concurrent intravitreal antiviral therapy (ganciclovir N=1; foscarnet N=1) and adoptive immunotherapy with CMV antiviral specific T-cells (N=1, HCT). Improvement of ocular symptoms occurred in 2 patients at 15 and 20 days after starting targeted CMV antiviral therapy; one patient developed permanently impaired vision.

Conclusion. CMVR remains as an important complication in transplant recipients. Although CMVR incidence was low in our cohort of transplant recipients, it occurred most frequently in cases of CMV resistance, prolonged DNAemia, and led to permanent visual impairment in 1 of 3 patients. The development of resistant CMV

	Subject 1	Subject 2	Subject 3
Age (y), sex	3, M	18, M	1.9, M
Pretransplant serology	D-/R+	D+/R-	D+/R+
Transplant, time post	alloHCT, D+183	OHT, D+512	alloHCT, D+34 Alpha Beta T cell depletion
Immunosuppression	MMF 200 mg TID pred 1 mg/kg/day rituximab	Tacrolimus 3 mg BID MMF 500 mg BID Deflazacort 30 mg qd	Recent conditioning: Flu/Mel/rAT
Ocular findings	Bilateral chorioretinitis Diffuse retinal hemorrhages Optic nn pallor, retinal necrosis	L eye chorioretinitis 20/100 vision intraretinal hemorrhages	Bilateral chorioretinitis Retinal whitening, intraretinal hemorrhages
CMV PCR at retinitis dx	1,463 copies/mL	3,000 IU/mL	14,204 IU/mL
CMV genotype resistance	no	UL97 mutation: H520Q	UL97 mutation: A594V
Antiviral at time of diagnosis	ACV	MAR	valGCV
Intravitreal	GCV	GCV->FOS	No
Systemic	FOS	FOS	FOS
Vision	Subretinal fibrosis, optic neuropathy; Impaired vision	Retinitis resolved, stable vision	Retinitis resolved, scarring of macula L, stable vision

Retinal scans

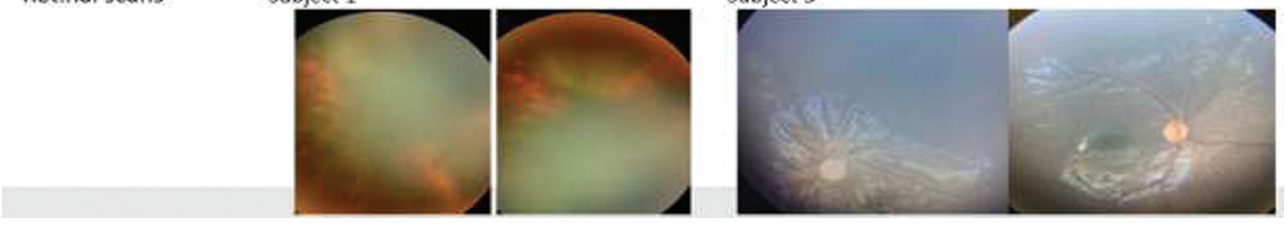

Figure 1. Demographic and clinical information among 3 pediatric transplant recipients with CMV retinitis. Abbreviations: M: Male D: Donor; R: Recipient; MMF: Mycophenolate mofetil; Pred: Prednisolone; L: Left; Flu: Fludarabine; Mel: Melphalan; rAT: Rabbit Antithymocyte globuline; ACV: Acyclovir; MAR: Maribavir; valGCV: Valganciclovir; GCV: Ganciclovir; FOS: Foscarnet.

may have a role in the occurrence, progression, and severity of CMVR. Additional pediatric-specific data are needed to better characterize CMVR and inform optimal prevention strategies.

#52: Clinical Features and Management of Pediatric Patients Presenting with New Onset Acute Leukemia and Concomitant COVID-19

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Background. Infections represent a significant cause of morbidity and mortality in pediatric patients undergoing treatment for hematologic malignancies. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection has led to a worldwide pandemic of coronavirus disease 2019 (COVID-19) and pediatric patients with cancer appear to be at higher risk of severe disease than reported in the general pediatric population. Data are limited on the optimal management of children infected with SARS-CoV-2 and a new diagnosis of leukemia. The objective of this study was to describe our experience of six children who presented with a new diagnosis of acute leukemia and concurrent COVID-19.

Methods. The study was IRB approved and children were enrolled following informed consent and assent as appropriate for age. The clinical presentations, serologic responses, treatments, and outcomes of patients who presented with acute leukemia and concurrent SARS-CoV-2 infection were abstracted. Residual blood was tested by ELISA for quantitative IgG to the SARS-CoV-2 spike protein receptor binding domain (RBD).

Results. From March 1, 2020 to Dec 31, 2020, 6 patients were identified with a new diagnosis of acute leukemia and SARS-CoV-2 infection including 3 with acute myeloid leukemia (AML) and 3 with acute lymphoblastic leukemia (ALL). The median age of our cohort was 9 years old (range 1 to 19 years old), 5 of 6 were male, and 4 of 6 patients were Hispanic. All 6 patients presented with symptoms that could be attributed to COVID-19 or acute leukemia, with fever being the most common. All 3 of the AML patients presented with hyperleukocytosis (white blood cell count > 50 x 10^9/L) and required oxygen therapy and intensive care. At the time of presentation, all patients with specimens available (n=5) had IgG antibodies to SARS-CoV-2 RBD. All patients received COVID-19 directed therapy, with remdesivir (n=5) and convalescent plasma (n=5) being the most common. Chemotherapy was modified or delayed in 5 of the 6 patients. The patient who received standard AML chemotherapy without awaiting COVID-19 directed treatment had delayed serologic response, delayed viral clearance from the nasopharynx, protracted respiratory failure, and ultimately died. For patients with a 12-week follow-up (n=5), 2 patients with AML had died, and the ALL patients were in remission and continuing their leukemia treatment.

Conclusion. COVID-19 may present concurrently in children with new onset leukemia resulting in severe morbidity and mortality. Our experience adds to growing evidence that children with AML and SARS-CoV-2 infection are at risk for severe COVID-19. Screening for SARS-CoV-2 infection with subsequent delay in chemotherapy and administration of COVID-19 directed therapies should be considered for pediatric patients with newly diagnosed acute leukemia and COVID-19.

Pediatric Infectious Diseases Research

#1: Pediatrics Institutional COVID-19 review

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Background. Coronavirus disease (COVID-19) caused by SARS-COV2 represents global public health concern, with varied severity of illness in different ages and racial groups. This study aims to describe clinical presentation and outcomes in children aged 0–18 years in a community hospital setting in the United States.

Methods. This is a retrospective medical record review of pediatric patients (0–18 years) admitted to Saint Barnabas Medical Center between March 2020- August 2020 with confirmed diagnosis of COVID-19 infection. Diagnosis of COVID-19 infection is based on ICD-10 diagnosis code from the coding abstract data of the hospital, and data analysis is based on retrospective chart review using electronic medical records for the patients included in the study. Patient data include demographics (age, sex, race), pre-existing conditions, presenting symptoms, treatments used and outcomes.

Findings. We identified 27 cases of pediatric COVID-19 patients at Saint Barnabas Medical Center during period of March 2020- August 2020. Fever (74%) was the most frequent symptom identified, followed by cough (44%), nausea/vomiting (30%), abdominal pain (19%), headache (19%), diarrhea (15%), shortness of breath (15%), red eyes (15%), rash (11%), chest pain (4%), and loss of taste/smell (4%). 13 out of 27 patients had imaging with chest X-ray, and 7 (54%) had findings of lung infiltrates or opacities. 6 of 27 patients had echocardiogram, and 4 (67%) had positive echocardiogram findings. 11 of 27 patients had some comorbid condition. 17 of 27 (63%) received no treatment. 3 patients (11%) were treated with IVIG + steroids, 2 (7%) received steroids only, 2 (7%) received Remdesivir, 1 (4%) received HCQ, and 1 (4%) received Tocilizumab along with IVIG+ steroids. Only 3 of 27 patients (11%) required supplemental oxygen treatment. No deaths were reported. Of 27 patients, 11 (41%) received inpatient care in general pediatrics, 10 (37%) received care only in ER, 4 (15%) received ICU level of care, and 2 (7%) received care in newborn nursery. Of 27 patients, 17 (63%) were female, and 10 (37%) were male. Race distribution was 48% black, 22% white, 4 % Asian Indian, and 26% others/unknown. Age distribution was 41% aged >15 yrs, 19% aged 6–10 yrs, 15% aged 1–5 yrs, 11% aged 11–15 yrs, 11% newborn, and 4% 0–1 yr.

Interpretation. This review supports findings from other studies in children showing overall good prognosis in children diagnosed with COVID-19 infection. This study also shows that there is some racial component involved as black children were infected twice as much as white children. However, it requires more longitudinal studies to confirm these findings, and better understand symptomatology and disease course in children with COVID-19 infection.

Tables:

	n=27			
Age				**%**
Newborn (o days)	**3**			**11%**
<1 y	**1**			**4%**
1-5 y	**4**			**15%**
6-10 y	**5**			**19%**
11-15 y	**3**			**11%**
>15 y	**11**			**41%**
Sex				
Male	**10**			**37%**
Female	**17**			**63%**
Race				
Black	**13**			**48%**
White	**6**			**22%**
Other	**6**			**22%**
Asian Indian	**1**			**4%**
Unknown	**1**			**4%**
Respiratory support				
None			**24**	**89%**
O2			**3**	**11%**
Level Of Care				
ER	**10**	**37%**		
Pediatrics	**11**	**41%**		
ICU	**4**	**15%**		
Nursery	**2**	**7%**		
Imaging	**Total**	**Normal**	**Positive**	
CXR	**13**	**6**	**7**	**54%**
Echo	**6**	**2**	**4**	**67%**
CT chest	**0**	**0**	**0**	
Symptoms				
Fever	**20**			**74%**
Cough	**12**			**44%**
SOB	**4**			**15%**
Chest Pain	**1**			**4%**
Myalgia/Bodyaches	**4**			**15%**
Headache	**5**			**19%**
Rash	**3**			**11%**
Conjunctivitis	**4**			**15%**
Nausea/Vomiting	**8**			**30%**
Diarrhea	**4**			**15%**
Abd pain	**5**			**19%**
Loss of smell/taste	**1**			**4%**
Treatment				
None	**17**			**63%**
Steroids only	**2**			**7%**
IVIG + Steroids	**3**			**11%**
IVIG + Steroids + Toci	**1**			**4%**
Remdesivir	**1**			**4%**
HCQ + Remdesivir	**1**			**4%**
Bicillin	**1**			**4%**
Augmentin + Zitthromax	**1**			**4%**
Co-Morbidities				
None	**16**			
Present	**11**			