Figure 2

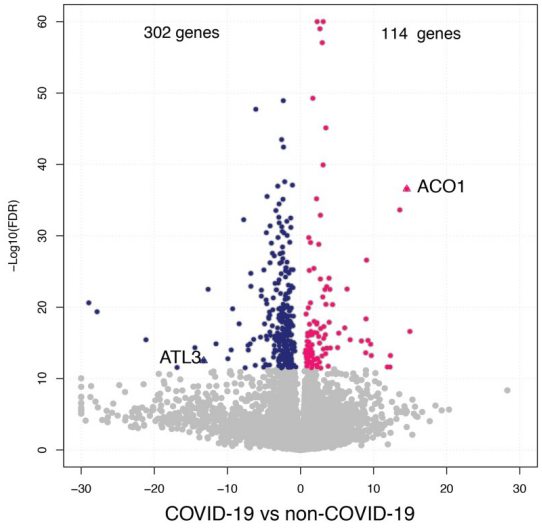


Fig2. Using COCONUT conormalized data, we compared head-to-head COVID-19 versus non-COVID-19 viral infections . Significance score [defined as -log10(FDR)] vs mean difference of co-normalized log2-transformed expression data between COVID-19 patients (n = 62) vs other viral infections (n = 652). The chosen cutoff of ES ≥ 1 or ≤ -1 with FDR ≤ 0.05% yields 416 COVID-19 specific signature, including 114 positively regulated genes and 302 negatively regulated genes.

Figure 3

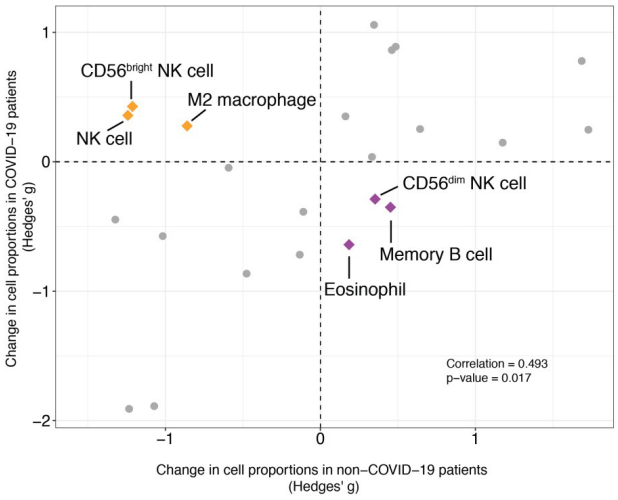


Fig3. Concordant and discordant changes in cellular proportions estimated with statistical deconvolution of bulk transcriptomic data comparing COVID-19 to non-COVID-19 viral infections. Cell types that increased in COVID-19 (hence decreased in non-COVID-19) were CD56^{bright} NK cells, M2 macrophages, and total NK cells. Those that decreased in non-COVID-19 but increased in COVID-19 were CD56^{dim} NK cells, memory B cells, and eosinophils. c) Concordant and discordant changes in cellular proportions comparing COVID-19 to non-COVID-19 viral infections. Cell types that increased in COVID-19 (hence decreased in non-COVID-19) were CD56^{bright} NK cells, M2 macrophages, and total NK cells. Those that decreased in non-COVID-19 but increased in COVID-19 were CD56^{dim} NK cells, memory B cells, and eosinophils.

Conclusion: The concordant and discordant responses mapped here provide a window to explore the pathophysiology of COVID-19 vs other viral infections and show clear differences in signaling pathways and cellularity as part of the host response to SARS-CoV-2.

Disclosures: Simone A. Thair, PhD, Inflammatix, Inc. (Employee, Shareholder) Yudong He, PhD, Inflammatix Inc. (Employee) Yehudit Hasin-Brumshtein, PhD, Inflammatix (Employee, Shareholder) Suraj Sakaram, MS in Biochemistry and Molecular Biology, Inflammatix (Employee, Other Financial or Material Support, stock options) Rushika R. Pandya, MS, Inflammatix Inc. (Employee, Shareholder) David C. Rawling, PhD, Inflammatix Inc. (Employee, Shareholder) Purvesh Khatri, PhD, Inflammatix Inc. (Shareholder) Timothy Sweeney, MD, PHD, Inflammatix, Inc. (Employee, Shareholder)

522. The Simple and Novel SAS Score to Predict Mortality at Presentation in 2541 Hospitalized COVID-19 Patients

Tommy J. Parraga Acosta, MD[1]; Amit T. Vahia, MD MPH[1]; Zohra S. Chaudhry, MD[1]; Smitha Gudipati, MD[2]; Samia Arshad, MPH[2]; Mayur Ramesh, MD[2]; Marcus Zervos, MD[2]; George J. Alangaden, MD[1]; [1]Henry Ford Hospital, Dearborn, MI; [2]Henry Ford Health System, Detroit, Michigan

Session: P-19. COVID-19 Research

Background: The clinical spectrum of the novel corona virus disease 2019 (COVID-19) ranges from mild to severe disease and death. We aim to construct a simple and novel scoring model that will predict mortality events in hospitalized COVID-19 patients.

Methods: We established a retrospective cohort of 2541 patients admitted with COVID-19 from February 19, 2020 to April 28, 2020 to Henry Ford Health System, MI. Sociodemographic data, comorbidities, and clinical data were collected. Our novel SAS score was constructed using 3 easily available parameters, namely **S**ex, **A**ge, and Oxygen **S**aturation at presentation (Table 1 and 2). Primary endpoint was mortality. Multivariate analysis with logistic regression was done and the model was assessed using receiver operating characteristic (ROC) with area under ROC (AUROC) to determine the optimal cutoff for sensitivity, specificity, and positive and negative predictive values.

Table 1. The SAS score points calculator

Variable	Points
Sex	
Female	0
Male	1
Age in years	
≤60	0
61-70	1
71-80	2
>80	3
SpO2 %	
>94	0
90-94	1
<90	2

Abbreviations: SpO2, oxygen saturation

Table 2. Clinical characteristics of 2541 hospitalized patients with COVID-19

Characteristic	Survivors N=2081	Non-Survivors N=460	*P* Value
Age Mean (SD)	61.2 (16.0)	75 (13.8)	<0.0001
Age ≥65 N (%)	892 (42.86)	371 (80.65)	<0.0001
Male gender N (%)	1036 (49.78)	262 (56.96)	0.005
Race N (%)			
Black	1198 (57.57)	213 (46.3)	<0.0001
White	645 (31)	207 (45)	
Asian	43 (2.1)	4 (0.87)	
Other	195 (9.37)	36 (7.83)	
	N=1966	N=424	
BMI Median (IQR)	31 (26.5-36.7)	27.6 (23.4-32.5)	<0.0001
BMI ≥30 N(%)	1099 (52.81)	151(32.83)	<0.0001
Comorbidities N (%)			
Lung	1330 (63.91)	289 (62.83)	0.661
Immunodeficiency	24 (1.15)	6 (1.30)	0.786
Cardiac disease	156 (7.5)	66 (14.35)	<0.0001
CKD	800 (38.44)	299 (65)	<0.0001
COPD	299 (11)	96 (20.87)	<0.0001
Hypertension	1343 (64.54)	320 (69.57)	0.040
Asthma	216 (10.38)	35 (7.61)	0.072
Cancer	285 (13.7)	95 (20.65)	0.0002
Diabetes	771 (37.1)	184 (40)	0.237
Max mSOFA score Median (IQR)	2 (1-4)	7 (5-9)	<0.0001
SOFA Category N (%)			
0-1	488 (32.38)	9 (2.41)	<0.0001
2-4	715 (47.45)	84 (22.52)	
≥5	304 (20.17)	280 (75.1)	
Maximum pulse oximetry Median (IQR)	92 (90-94)	89 (82-92)	<0.0001
Saturation categories N (%)			
≥95			<0.0001
90-94	463 (22.25)	41 (8.91)	
86-89	1099 (52.81)	176 (38.26)	
≤85	232 (15.52)	85 (18.48)	
	196 (9.42)	158 (34.35)	
Treatments N (%)			
Hydroxychloroquine	1666 (80.1)	319 (69.35)	<0.0001
Azithromycin	740 (35.56)	190 (41.3)	0.021
Methylprednisolone	1135 (54.54)	321 (69.78)	<0.0001
Prednisone	547 (26.3)	85 (18.48)	0.001
Tocilizumab	62 (2.98)	52 (11.3)	<0.0001
ICU admission N (%)	333 (16)	281 (61.1)	<0.0001
ICU days Median (IQR)	7 (4-12)	9 (5-14)	0.001
Mechanical ventilation N (%)	193 (9.27)	255 (55.43)	<0.0001
Ventilator days N (%)	8 (4-12)	9 (4-13)	0.207

Abbreviations: SD, standard deviation; BMI, body mass index; IQR, interquartile range; CKD, chronic kidney disease; COPD, chronic obstructive pulmonary disease; mSOFA, modified SOFA (Sequential organ failure assessment) score; ICU, intensive care unit.

Results: The mean age of survivors was 61 compared to 75 years for non-survivors (standard deviation 16 vs 13.8, p< 0.0001), and 1298 (51.1%) were men. Multivariate

analysis of the SAS score adjusted for modified SOFA [Sequential organ failure assessment] score (mSOFA) showed that age (odds ratio [OR] 2.4, 95% confidence interval {CI} 2.04–2.72, p< 0.0001) and oxygen saturation (OR 1.6, 95% CI 1.27–1.98) were the most significant predictors of mortality in the model. The SAS score had an AUROC of 0.78 (95% CI 0.77–0.81) (Figure 1). A cutoff score of 3 offered the most sensitivity for predicting mortality while maintaining a negative predictive value of 95% (Table 3). Comparison of AUROC shows that SAS score adjusted to mSOFA has better diagnostic information compared to either SAS score or mSOFA alone (Figure 2).

Table 3. Accuracy of the SAS score for predicting mortality in COVID-19 patients

SAS score and Variables	Performance
AUROC	0.78 (0.77-0.81)
SAS score 3 (95% CI)	
Sensitivity, %	86.5 (83.1-89.5)
Specificity, %	54.3 (52.1-56.4)
Positive predictive value, %	29.5 (28.3-30.7)
Negative predictive value, %	94.8 (52.1-56.4)
SAS score 4 (95% CI)	
Sensitivity, %	64.6 (60.0-68.9)
Specificity, %	77.9 (76.1-79.7)
Positive predictive value, %	39.2 (36.8-48.9)
Negative predictive value, %	90.9 (89.8-91.9)

Abbreviations: AUROC, area under ROC curve; ROC, receiver operating characteristic; SAS, sex, age, and oxygen saturation score, CI, confidence interval.

Figure 1. Probability of SAS score cutoff points to predict mortality in COVID-19 patients

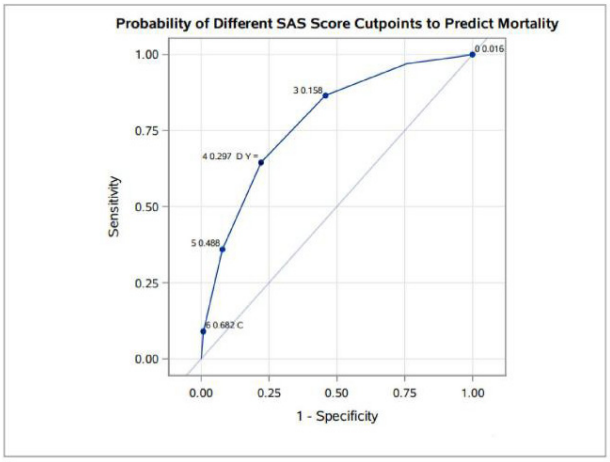
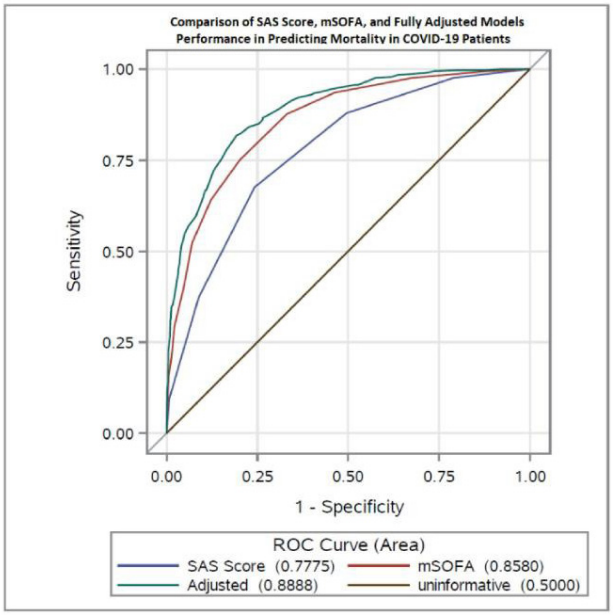


Figure 2. Comparison of ROC curves of SAS score, mSOFA and adjusted model in predicting mortality in COVID-19 patients



Conclusion: The easy to use SAS score at time of presentation identified hospitalized COVID-19 patients at high risk for mortality. Application of the SAS score in the emergency department may help triage patients to inpatient versus outpatient care.

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523. COVID-19 Preparedness in Hospice and Palliative Care

Monika Pogorzelska-Maziarz, PhD, MPH, CIC[1]; Jeannette Kates, PhD, APRN, AGPCNP-BC[1]; Jingjing Shang, PhD, RN[2]; Angela M. Gerolamo, PhD, RN[1]; [1]Thomas Jefferson University, Philadelphia, PA; [2]Columbia University School of Nursing, New York, NY

Session: P-20. COVID-19 Special Populations

Background: Due to the emergence of COVID-19 and resulting pandemic, there is an increased demand for palliative care and hospice care services. However, the impact of COVID-19 on the hospice and palliative agencies is unknown.

Methods: An electronic survey was disseminated via the Hospice & Palliative Nurses Association newsletter, posted to the Sigma Theta Tau Hospice and Palliative Care Community Group discussion board and advertised through social media from May 7–28, 2020. Summary statistics were computed.

Results: We collected 36 surveys representing all U.S. regions. Most respondents (78%) reported that their agency has cared for confirmed COVID-19 patients. Only half of agencies had access to laboratory facilities for surveillance and detection of the presence of outbreaks in both patients and staff (58%) and the ability to test patients and providers for COVID-19 (55%). Due to COVID-19, participants stated that the agency added new protocols regarding aerosol-generating procedures policies (58%), use of surface barriers (61%) and PPE usage (e.g. donning and doffing) in patient homes (56%). The majority (76%) reported that their agency required field clinicians to call ahead to ascertain COVID-19 exposure/symptoms before a home visit.

More than half (58%) reported that their agency lacked supplies, including N95 respirators (45%), cleaning/disinfectant product (23%), alcohol based sanitizer (18%), eye protection (18%), gowns (18%), and surgical masks (14%). Overall, participants shared that field clinicians had to reuse (76%), extend (73%) or ration (30%) PPE supplies. Respondents reported that their agency accessed supplemental PPE through state/local resources (67%), private/community donations (67%), and do-it-yourself efforts (55%). One third (31%) reported that their agency was experiencing staffing shortages due to COVID-19; of these, 60% reported that shortages were due to staff infected with/quarantined due to COVID-19.

Conclusion: Our findings suggest that COVID-19 has presented significant challenges for palliative care and hospice agencies as they provide care to patients and families at an unprecedented rate.

Disclosures: **All Authors**: No reported disclosures

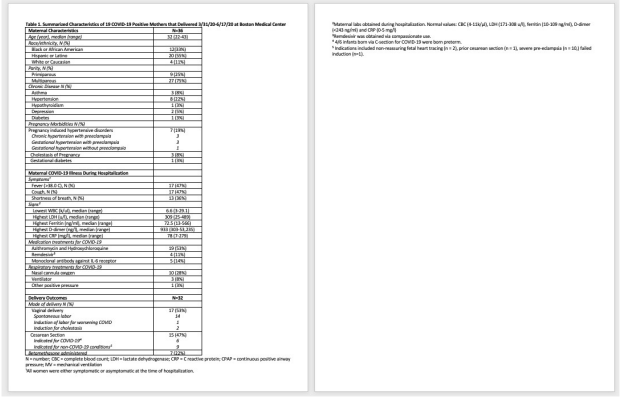
524. *COVID 19* Infection in Pregnant Women and Newborn Infants at a Single U.S. Center: What Disparities, Testing and Isolation Practices can Teach Us

ingrid Y. Camelo, MD, MPH[1]; Marisol Figueira, MD[2]; Vishakha Sabharwal, MD[3]; [1]BMC, Boston, MA; [2]Proffesor, Boston, Massachusetts; [3]MD, Boston, Massachusetts

Session: P-20. COVID-19 Special Populations

Background: COVID-19 transmission from mother to infant suggests that vertical and horizontal transmission of COVID-19 are possible. Here we describe the demographic and clinical characteristics and outcomes of SARS-CoV-2 positive pregnant women and their newborns.

Summarized Characteristics of 19 COVID-19 Positive Mothers that Delivered 3/31/20–6/17/20 at Boston Medical Center



Methods: We collected data from the electronic medical records of pregnant women. Data composed of maternal demographics and morbidities, and symptoms of COVID-19. Descriptive statistics were used to analyze data. Women had positive polymerase chain reaction (PCR) testing done by nasopharyngeal swabs.