Correlation analysis of severity hematological variables with hospital outcome

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Variables n = 100	Female gender	Age	Neutrophil-lymphocyte index	Platelet-lymphocyte index	Systemic inflammation-immunity index	Severe pneumonia	Death
Gender							
r	1.000						
p							
Age							
r	0.060§	1.000					
p	0.552						
Neutrophil-lymphocyte index							
r	0.625§	0.185£	1.000				
p	0.521	0.660					
Platelet-lymphocyte index							
r	-0.068§	0.030£¤	0.441£	1.000			
p	0.501	0.771	0.001				
Systemic inflammation-immunity index							
r	-0.033§	0.097¤	0.737£	0.705£	1.000		
p	0.742	0.338	0.001	0.001			
Severe pneumonia							
r	0.155*	0.512£	0.523£	0.182£	0.204£	1.000	
p	0.125	0.001	0.001	0.069	0.042		
Death							
r	0.209*	0.321§	0.533§	0.199§	0.176§	0.626§	1.000
p	0.037	0.001	0.001	0.047	0.079	0.001	

§ Spearman's correlation

£ Pearson's Correlation

* Phi correlation

Results: We included 100 patients, 54 (54%) women and 46 (46%) men, with a mean age of 49.4 ± 19.3 years. The mean of leukocytes was 10,103.0 ± 4,289.0 cel / mm3, neutrophils 8,509.3 ± 4,216.0 cel / mm3 and lymphocytes of 1,112.7 ± 585.4 cel / mm3; Regarding the hematological indices used to measure severity, we found that the mean of the INL was 10.7 ± 10.9, that of the IPL was 290.1 ± 229.2 and that of the IIIS was 2.6 ± 3.4 x 109. Regarding the type of pneumonia, 54 (54%) had mild pneumonia and 46 (46%) had severe pneumonia. Regarding hospital outcomes, 75 (75%) of the patients were discharged due to clinical improvement and 25 (25%) of the patients died during the hospital stay. The mean age was significantly higher in the group of patients who died during the hospital stay (45.9 ± 18.6 VS 60.0 ± 17.5 years, p = 0.001), the proportion of women who died was higher and tended to be statistically significant. The mean INL was 20.4 ± 16.9 in patients who died VS 7.5 ± 4.9 in patients who improved (p = 0.001). The mean IPL was 417.1 ± 379.7 in patients who died VS 247.7 ± 127.4 in patients who had improvement; p = 0.038. Finally, the mean IIIS was significantly higher in patients who died VS patients who had clinical improvement (4.8 ± 6.1 VS 1.9 ± 1.2; p = 0.030, respectively). In the correlation analysis, high and significant r were found in the three indices.

Conclusion: Neutrophil-lymphocyte, platelet-lymphocyte and systemic immunity-inflammation indices in patients with Covid-19 pneumonia can be used as predictors of severity and predict hospital outcome.

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390. Non-invasive Detection of Co-infections in Hospitalized Patients with COVID-19 using the Karius Test, A Plasma-based Next-Generation Sequencing Test for Microbial Cell-free DNA
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Session: P-12. COVID-19 Complications, Co-infections, and Clinical Outcomes

Background: Patients hospitalized with SARS-CoV2 infections (Covid-19) are frequently febrile and can become critically ill quickly often leading to intervention with antimicrobial therapy. An etiologic diagnosis of superinfections can be difficult to obtain through the usual invasive procedures because of patient instability and the desire to avoid them because they may not be tolerated by the patient. Providers may also be hesitant to embark on such interventions in order to avoid healthcare personnel (HCP) exposure to aerosols.

Methods: Karius Test (KT) results are presented from 30 patients who presented with Covid-19. The KT is a CLIA certified/CAP-accredited next-generation sequencing (NGS) plasma test that detects pathogen cell free DNA (cfDNA). After cfDNA is extracted and NGS performed, human reads are removed and remaining sequences are aligned to a curated database of > 1400 organisms. Organisms present above a statistical threshold are reported.

Results: The KT detected pathogens in the majority of patients (n=20) with COVID-19. The most common infections were herpesviruses in 60% of patients. The most common bacterial pathogen was E. coli seen in 25% of patients. 15 out of 20 patients had more than one pathogen detected. 15% of patients had fungal pathogens, including one detection of *Lichtheimia ramosa,* in an immunocompromised patient. The results are summarized in the table.

Co-infections detected by the Karius Test in patients hospitalized with COVID-19

Category	Pathogens	# detected
Herpes viruses	CMV	5
	EBV	4
	HSV-1	3
Polyomavirus	BK Polyomavirus	2
Gram negative aerobes	E. coli	5
	Pseudomonas aeruginosa	2
	Helicobacter pylori	2
	Klebsiella variicola	1
	Hafnia paralvei	1
	Burkholderia cenocepacia	1
	Enterobacter cloacae	1
Gram negative anaerobes	Prevotella spp.	3
	Bacteroides spp.	2
	Veillonella dispar	1
Gram positives	Streptococcus spp.	6
	Lactobacillus spp.	3
	Enterococcus spp.	2
	S. aureus	2
	Rothia spp.	2
	Staph. epidermidis	1
Fungi	C. albicans	1
	C. parapsilosis	1
Mucorales	Lichtheimia ramosa	1

Conclusion: Open-ended, plasma-based NGS for mcfDNA provides a non-invasive method to assess for co-infections in critically ill patients with COVID-19. This report highlights the potential to increase diagnostic yield as well as to decrease the need for invasive procedures – and their attendant risks to patients and HCP – to obtain etiologic diagnoses to better inform antimicrobial therapy for superinfection. It also serves to highlight the variety of pathogens affecting these patients during the COVID-19 pandemic.

Disclosures: William V. La Via, MD, Karius (Employee) Sudeb Dalai, MD, Karius (Employee) Christiaan R. de Vries, MD, PhD, Karius (Consultant, Independent Contractor)Stanford University (Employee) Ann Macintyre, DO, Karius (Employee) Asim A. Ahmed, MD, Karius (Employee)

391. Outcomes of Empiric Antimicrobial Therapy in COVID-19 Positive Patients
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Session: P-12. COVID-19 Complications, Co-infections, and Clinical Outcomes

Background: The COVID-19 pandemic has revealed new challenges for antimicrobial stewardship. Optimal medical treatment is not completely understood at this time. The epidemiology and outcomes of bacterial co-infections are not well-established; however, empiric antibiotic (abx) use is anecdotally common. The purpose of this study is to characterize empiric antimicrobial drug selection and timing in COVID-19 and evaluate the impact on patient outcomes.

Methods: Cross-sectional cohort study for COVID-19 positive inpatients from March 1, 2020 to June 1, 2020 at an academic medical center and 4 community hospitals. Inclusion: patients with a documented positive COVID-19 PCR nasopharyngeal swab. Exclusion: patients less than 18 years; deceased or transitioned to hospice within 24 hours of admission. Primary endpoint: empiric abx drug, initiation, duration and indication. Additional data collected: severity of illness, co-infection diagnosis, microbiology, and adverse drug effects (ADE). Clinical outcomes included time to recovery by COVID-19 ordinal outcome, clinical status at day 15, and readmission.

Results: 400 patients were included with 27% from the ICU. COVID symptom category included mild (23.8%), moderate (53%), severe (15%), and critical (8.3%).