337. SARS-CoV-2 Viral Load Does Not Predict Incident Venous Thromboembolism in COVID-19

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The EPICC Study Group

Session: P-14. COVID-19 Complications, Co-infections, and Clinical Outcomes

Background. The risk factors of venous thromboembolism (VTE) in COVID-19 warrant further study. We leveraged a cohort in the Military Health System (MHS) to identify clinical and virological predictors of incident deep venous thrombosis (DVT), pulmonary embolism (PE), and other VTE within 90-days after COVID-19 onset.

Methods. PCR or serologically-confirmed SARS-CoV-2 infected MHS beneficiaries were enrolled via nine military treatment facilities (MTF) through April 2021. Case characteristics were derived from interview and review of the electronic medical record (EMR) through one-year follow-up in outpatients and inpatients. qPCR was performed on upper respiratory swab specimens collected post-enrollment to estimate SARS-CoV-2 viral load. The frequency of incident DVT, PE, or other VTE by 90-days post-COVID-19 onset were ascertained by ICD-10 code. Correlates of 90-day VTE were determined through multivariate logistic regression, including age and sampling-time-adjusted log10-SARS-CoV-2 GE/reaction as *a priori* predictors in addition to other demographic and clinical covariates which were selected through stepwise regression.

Results. 1473 participants with SARS-CoV-2 infection were enrolled through April 2021. 21% of study participants were inpatients; the mean age was 41 years (SD = 17.0 years). The median Charlson Comorbidity Index score was 0 (IQR = 0 - 1, range = 0 - 13). 27 (1.8%) had a prior history of VTE. Mean maximum viral load observed was 1.65 x 10^7 genome equivalents/reaction. 36 (2.4%) of all SARS-CoV-2 cases (including inpatients and outpatients), 29 (9.5%) of COVID-19 inpatients, and 7 (0.6%) of outpatients received an ICD-10 diagnosis of any VTE within 90 days after COVID-19 onset. Logistic regression identified hospitalization (aOR = 11.1, p = 0.003) and prior VTE (aOR = 6.2 , p = 0.009) as independent predictors of VTE within 90 days of symptom onset. Neither age (aOR = 1.0, p = 0.50), other demographic covariates, other comorbidities, nor SARS-CoV-2 viral load (aOR = 1.1, p = 0.60) were associated with 90-day VTE.

Conclusion. VTE was relatively frequent in this MHS cohort. SARS-CoV-2 viral load did not increase the odds of 90-day VTE. Rather, being hospitalized for SARS-CoV-2 and prior VTE history remained the strongest predictors of this complication.

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338. Multicenter Evaluation of Superinfection Occurrence and Impact on Clinical Outcomes in Patients with COVID-19

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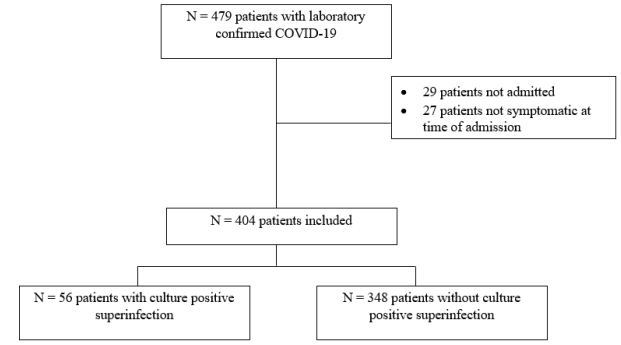
Session: P-14. COVID-19 Complications, Co-infections, and Clinical Outcomes

Background. The coronavirus disease 2019 (COVID-19), caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), spread globally throughout late 2019. During this pandemic, concern for bacterial and fungal superinfections has been present during the treatment of these patients.

Methods. Hospitalized, adult patients with laboratory confirmed and symptomatic COVID-19 disease admitted between March 12, 2020 and May 31, 2020 were eligible for inclusion in this study. Data was obtained from electronic medical records and the hospital system's clinical surveillance program including demographics, comorbidities, hospitalization dates, laboratory values, mechanical ventilation, positive blood and respiratory cultures, treatment administration for COVID-19 as defined by the system's fluid treatment algorithm, and discharge disposition. Outcomes of this analysis include overall bacterial and fungal superinfection occurrence rate within 28 days of admission, patient characteristics that correlate with a higher risk of a superinfection, and the effect on 28-day mortality.

Patient Population

Figure 1.



Flow diagram of patient inclusion.

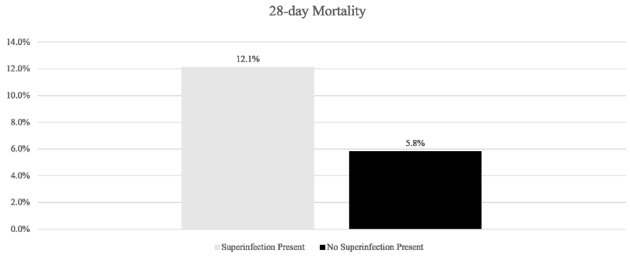
Results. A total of 404 patients were included in the study analyses of which 56 (13.9%) had a documented superinfection within 28-days from admission. The most common superinfection organisms observed were *Staphylococcus* spp. (36.9%), *Candida* spp. (16.7%), and *Klebsiella* spp. (13.1%). Mortality was significantly higher in patients with superinfections (12.1% vs 5.8%, $p < 0.001$). To best assess characteristics that place patients at a higher risk of superinfection, a backwards, stepwise, multivariable logistic regression was performed. Black ethnicity, chronic kidney disease, intensive care unit (ICU) upon admission, lymphocytopenia, and receipt of tocilizumab were found to more likely have a superinfection within 28-days from admission.

Baseline Characteristics

Demographics	Superinfection Present (n=56)	No Superinfection Present (n=348)	p value
Baseline Demographics			
Age (years), median	65	58	0.004
Sex (male)	50.0%	53.6%	0.246
Ethnicity			
Asian	7.1%	5.2%	0.546
Black	39.3%	26.4%	0.047
Caucasian	51.8%	60.9%	0.196
Native American	1.8%	2.0%	0.910
Other	0.0%	0.6%	0.570
Declined/Unavailable	0.0%	4.9%	0.322
BMI (body mass index), median	31.6	31.0	0.601
Comorbidities			
Diabetes	64.3%	37.1%	<0.001
Hypertension	78.6%	58.3%	0.004
Heart failure	32.1%	13.5%	<0.001
Chronic Pulmonary Disease	17.9%	6.3%	0.003
History of Nicotine or Tobacco Use	23.2%	18.4%	0.394
Malignancy	7.1%	7.5%	0.931
Chronic Kidney Disease	28.6%	12.1%	0.001
Chronic Liver Disease	10.7%	9.5%	0.772
Duration of Symptoms Prior to Admission (days)	7.8	7.7	0.960
ICU upon Admission	56.6%	18.1%	<0.001
Ordinal Scale Score on Admission, range	2.4 (2 – 5)	2.1 (2 – 4)	<0.001
Vitals on Admission			
Heart Rate, median	101.4	94.6	0.016
Respiratory Rate, median	23.3	21.0	0.002
Temperature (Fahrenheit), median	99.7	99.4	0.180
SpO2 (%), median	91.2	95.1	<0.001
Systolic Blood Pressure (mm Hg), median	138.9	134.7	0.189
Diastolic Blood Pressure (mm Hg), median	74.5	74.8	0.429
Baseline Biomarkers			
D-dimer, mcg/mL (n=282)	2.8	1.7	0.040
C-reactive Protein, mcg/mL (n=291)	21.0	9.8	0.006
Ferritin, ng/mL (n=289)	1129.8	1179.8	0.926
LDH, U/L (n=286)	662.6	333.4	0.005
Procalcitonin, ng/mL (n=140)	1.7	2.3	0.776
IL-6 , pg/mL(n=227)	226.6	109.1	0.041
Lymphocytes (n=402), median	11.5%	17.9 %	<0.001
COVID-19 Treatment			
Remdesivir	32.1%	29.3%	0.667
Tocilizumab	55.4%	25.3%	<0.001
Convalescent Plasma	17.9%	19.3%	0.805

Comparison and analysis of baseline characteristics in patients with or without superinfection present.

28-day Mortality



Day-28 mortality comparison in patients with or without superinfection. Mortality was observed in 7/58 patients with a superinfection versus 20/346 patients without superinfection present ($p < 0.001$).

Significant Variables with Correlation of Increased Superinfection Risk	
Variables	**p value**
Black Ethnicity	0.046
Chronic Kidney Disease	0.008
ICU upon Admission	<0.001
Lymphocytopenia	0.007
Tocilizumab	0.029

Multivariable analysis results for increased superinfection risk. All baseline characteristics with univariate analysis resulting in a p value of < 0.2 were included in the backwards, stepwise logistic regression model.

Conclusion. In conclusion, our retrospective cohort study reports a superinfection rate of 13.9%. Presence of a superinfection significantly increases the likelihood of mortality within 28-days from admission. Characteristics that have a significant correlation to increased risk of superinfections include Black ethnicity, chronic kidney disease, ICU upon admission, and receipt of tocilizumab.

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339. COVID-19 Mortality in a Private Hospital in Mexico City

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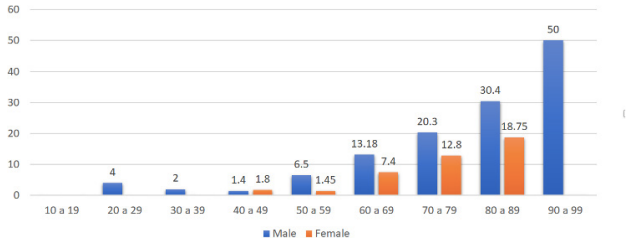
Session: P-14. COVID-19 Complications, Co-infections, and Clinical Outcomes

Background. According to the Institute of Global Health Science (IGHS), mortality for Covid-19 patients treated in public hospitals in Mexico ranges between 30-50%, decreasing to 20% in private health care facilities. Our objective was to describe the mortality rate in a teaching private hospital in Mexico City.

Methods. We included all patients that were admitted to hospital Medica Sur, in the south part of Mexico City during year 2020. We analyzed the total mortality presented in all our patients with a follow up of two months, and relay that to age and gender.

Results. During year 2020, we admitted in our hospital 1,075 patients with confirmed diagnosis of COVID-19 through nasopharyngeal molecular test; 772 were male (71.8%) with more than 50% between 40 and 59 years, while females were more frequent between 40 and 69 years' age. Seventy-four patients (6.88%) died during hospitalization; 59 (79.7%) males and 15 females. Mortality rate was clearly related to age (figure 1) with 30% mortality for males between 80-89 years and 19% for females.

Mortality rate by gender and age



Conclusion. Mortality in private hospitals was clearly lower than in public hospitals. In our hospital, mortality was lower than 10%, mostly related to their availability of unlimited intensive care without ECMO and despite the lack of some drugs like Remdesivir. As described, space limitations for intensive care as well as the lack of trained personal impacted significantly the mortality in public hospitals.

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

340. Outcomes of COVID-19 in Hospitalized SOT Recipients: Experence in Colombia, South America

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Session: P-14. COVID-19 Complications, Co-infections, and Clinical Outcomes

Background. SOTs (SOT) recipients with COVID-19 are considered to be at high risk of severe clinical outcomes. Several descriptive studies have reported a high frequency of intensive care unit admission and death rates. There is a lack of evidence regarding the best approach for immunosuppressive therapy in SOT recipients with COVID-19.

Methods. We performed a single-centered, retrospective, observational study of all SOT recipients with SARS-CoV-2 confirmed infection RT-PCR from nasopharyngeal swab specimens who were admitted to the emergency department from March 25 to September 1, 2020. Glucocorticoid therapy was administered according to the criteria of the attending physician. We classified glucocorticoid dose as low dose therapy if the patient received dexamethasone 6 mg/day or methylprednisolone 40 mg/day, and a high dose if the patient received methylprednisolone 80–160 mg/day. Specimens collected within the first 48 hours were defined coinfection, while specimens collected after 48 hours were defined as hospital-acquired superinfection.

Results. Of a total of 43 SOT recipients with COVID-19, 17 (39%) required intensive care unit admission. 32 (74.4%) required glucocorticoid therapy: 13 received low dose and 19 high dose. 15 (34.8%) had secondary infections. A total of 12 (27.9%) presented hospital-acquired bacterial superinfections, mostly caused by P. aeruginosa, most of isolations were from respiratory tract cultures. The median time from hospital admission to superinfection diagnosis was 9 (7-13) days. Community-acquired co-infection at COVID-19 diagnosis was documented only in 3 (6.9%) patients, mostly caused by K. Pneumoniae, all isolations were from urine culture. Glucocorticoid therapy was indicated in 32 (80%) patients, 19 received high dose and 13 low doses. Overall hospital mortality was 17.5%. ICU mortality was 41%. Overall mortality in the high dose steroids group was 37 % vs . 0% in the low dose group.

Conclusion. Our results showed a higher frequency of superinfection in SOT recipients with COVID-19 compared to previous reports, and higher ICU mortality. Further studies are needed to establish the best approach for glucocorticoid therapy in SOT recipients with COVID-19.

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

341. Evaluation of Antimicrobial Use and Prescribing Patterns During the COVID-19 Pandemic in Patients Receiving Tocilizumab

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Session: P-14. COVID-19 Complications, Co-infections, and Clinical Outcomes

Background. Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infected patients experience systemic inflammation and respiratory distress, which appears to be associated with increased cytokine release. During the peak of coronavirus disease 2019 (COVID-19), tocilizumab was used to treat critically ill patients with potential cytokine storm. However, tocilizumab has an increased risk of developing serious infections.

Methods. This retrospective observational chart review was approved by Institutional Review Board and evaluated patients admitted from March to November 2020, who were SARS-CoV-2 positive and received tocilizumab for the treatment group and no tocilizumab for the control group. The primary endpoint is usage of antimicrobials. The secondary endpoints are development and outcomes of secondary infections and hospital length of stay and mortality. Chi-square test was used for categorical data and Mann-Whitney test was used for continuous data.

Results. A total of 160 patients were included in analysis, with 80 in each arm. 60% of patients in the treatment group required antibiotics compared to 35% in the control group ($p = 0.0015$), with the highest usage of anti-MRSA coverage, beta-lactams, cephalosporins, and carbapenems in both groups. Antifungal therapy was required in 21.3% of patients in the tocilizumab group compared to 6.3% in the control group ($p = 0.0059$), with echinocandins being the most used class in both groups. The median days of antimicrobial use in the tocilizumab group was 14 (IQR 7, 24.5) compared to 9 (IQR 6.5, 19) in the control group ($p = 0.3346$). In the treatment group, 60% of patients developed a secondary infection compared to 35% of patients in the control group ($p < 0.0017$). Secondary infection treatment failure was observed in 75% of tocilizumab patients compared to 60.7% of control patients ($p = 0.1910$). In hospital mortality was 50% in patients who received tocilizumab compared to 27.5% in the control group ($p < 0.0039$).

Conclusion. Patients on tocilizumab received more antimicrobials, but with a similar spectrum of antimicrobial coverage. Patients who received tocilizumab had