



Figure 1. Trends in mortality in patient with and without ESRD.

Limitations of our study include - lack of proper validation studies of ICD codes for IE. Traditionally ESRD are sicker, although we did adjust for some comorbidities, adjustment for all known and unknown confounders in a retrospective analysis is not possible. NIS has the advantage of being a large database.

In conclusion, we noticed that mortality in IE with ESRD is decreasing, albeit slower than patient with no ESRD.

Disclosures

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Burden of Thrombotic Events in Coronavirus Disease-19 (COVID-19) Patients and Effect on Outcomes (from a Multicenter Electronic Health Record Database)

Coronavirus disease-19 (Covid-19) patients have been postulated to have high risk of thrombotic events (TE). There are variable estimates of the rate of TE with COVID-19 and derived from hospital case series mostly.^{1,2} Data on unfavorable outcomes, including mortality in Covid-19 patients with TE are limited. We use a large electronic health record (EHR) database to investigate these questions.



Table 1
Outcomes of Covid-19 patients with and without thrombosis, before and after propensity matching

Before propensity matching				
	COVID-19 with thrombotic events (N=4140)	COVID-19 without thrombotic events (N=116375)	Risk ratio (CI)	p Value
Mortality	15.3% (633)	2% (2358)	7.55 (6.96-8.19)	<0.001
Hospitalization	58.1% (2406)	16.0% (18632)	3.63 (3.53-3.74)	<0.001
Mechanical Ventilation	16.9% (698)	2.1% (2416)	8.12 (7.51-8.78)	<0.001
ARDS	18.7% (774)	1.6% (1895)	11.48 (10.62-12.41)	<0.001
Hemodialysis	8% (330)	0.7% (850)	10.91 (9.65-12.35)	<0.001
CRRT	2.6% (109)	0.2% (178)	17.21 (13.59-21.8)	<0.001
After propensity matching*				
	COVID-19 with thrombotic events (N=4140)	COVID-19 without thrombotic events(N=4140)	Risk ratio (CI)	p Value
Mortality	15.3% (633/4140)	4.8% (198/4140)	3.20 (2.74-3.73)	<0.001
Hospitalization	58.1% (2406/4140)	25.1% (1039/4140)	2.32 (2.18-2.46)	<0.001
Mechanical Ventilation	16.9% (698/4140)	3.9% (163/4140)	4.28 (3.63-5.05)	<0.001
ARDS	18.7% (774/4140)	2.7% (111/4140)	6.97 (5.74-8.47)	<0.001
Hemodialysis	3.6% (139/3861)	0.6% (26/4065)	5.63 (3.71-8.54)	<0.001
CRRT	2.1% (85/4062)	0.3% (13/4133)	6.65 (3.72-11.91)	<0.001

Notes: *= adjusted for age, race and gender.

Our clinical cohort included patients ≥ 18 years of age diagnosed with COVID-19 between January 20, 2020 and September 10, 2020. Covid-19 patients were identified via real-time search and analysis of more than 49 million patients from 33 healthcare organizations participating in a global health research network called TriNetX (Cambridge, MA). COVID-19 diagnosis was confirmed using specific COVID-19 diagnosis criteria recommended by the World Health Organization and Centers for Disease Control. COVID-19 patients were divided into two cohort (TE / no TE), based on presence of TE within 30 days of COVID-19 diagnosis. Validated ICD-10 diagnosis codes were used to identify TE (acute myocardial infarction-AMI, pulmonary embolism- PE, cerebro-vascular accident - CVA, peripheral arterial thrombosis, and deep venous thrombosis-DVT). Propensity score matching was performed for age, gender and race. Primary outcome tested was 30-day all-cause mortality post COVID-19 diagnosis. Secondary outcomes included hospitalization, need for mechanical ventilation, hemodialysis, continuous renal replacement therapy-CRRT, acute respiratory distress syndrome-ARDS and acute kidney injury. All statistical analyses were performed using TriNetX with standard methodology previously reported.³

A total of 120, 515 COVID-19 patients were identified including 4140 with TE (3.4%) – 1526: AMI, DVT – 1530, PE: 1140, CVA – 1014, peripheral arterial thrombosis: 140. Patients with TE were more likely to be male ($p < 0.001$), black ($p < 0.001$) and older (63.6 ± 15.9 vs 47.1 ± 18.7 , $p < 0.001$). Table 1 shows the outcomes before and after propensity matching. COVID-19 patients with TE had higher mortality (15.3% vs 2.0%), hospitalization (58.1% vs 16.0%) and need for mechanical ventilation (16.9% vs 2.1%) (p -values < 0.001). After propensity matching two well matched cohorts of 4140 patients were included in the analysis. Higher rates of mortality (15.3 v 4.8%), need for hospitalization (58.1% vs 25.1%) and mechanical ventilation (16.9% vs 3.9%) persisted in patients with TE, compared to patients without TE after propensity matching ($p < 0.001$).

Previous studies have reported 16% to 31% of COVID-19 patients to have some form of TE/complications and higher mortality in Covid-19 patients with TE.^{1,4} Our data from a very large sample of all-comers COVID-19 patients (including outpatients) shows a smaller prevalence of TE. This also provides more comprehensive estimates of the increased risk of worse outcomes including mortality in COVID-19 patients with

TE events and underscores the need for intensive screening and thromboprophylaxis in these patients. Our study is limited because of not accounting for comorbidities / anticoagulation or anti-platelet therapy – however, it still represents a broad outline of the burden of TE in the largest sample of COVID-19 patients so far reported.

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