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Introduction

- The SARS-COV2 virus targets the ACE2 receptor, an enzyme abundant in lung and renal epithelium.
- While initially the focus was on the respiratory aspects of the virus, renal manifestations became increasingly evident, specifically the incidence of acute kidney injuries (AKI).
- AKI has been shown to increase mortality among patients infected with SARS-COV2.^{1,2}
- In this study, we analyzed the clinical characteristics and outcomes of patients with COVID-19 who developed AKI upon admission to a single, tertiary care center in New Orleans, LA.

Methods

- A retrospective cohort study was conducted with patients admitted to a tertiary care center in New Orleans, LA with positive SARS-CoV-2 testing from March 9th to March 31st, 2020, who developed AKI.
- AKI was defined using the Kidney Disease Improve Global Outcomes (KDIGO) criteria
- For those with positive SARS-CoV-2-tests, various data was abstracted via EPIC into a REDCap database.
- All charts were reviewed until September 9th, 2020 to allow for a minimum of 4 months of follow up for all patients.

Table 1: Clinical characteristics and outcomes associated with severe AKI (stage II or III)

	All (118)	Stage I (45)	Stage II-III (73)	P-Value
ICU Admit	48 (45.3)	8 (18.6)	40 (63.5)	<.001
Ventilation	56 (47.9)	8 (18.2)	48 (65.8)	<.001
Death	36 (30.5)	2 (4.4)	34 (46.6)	<.001
Creatinine at Admit	2.06 (2.03)	1.49 (0.5)	2.4 (2.48)	0.003
Phosphorus	4.02 (1.53)	3.25 (1.19)	4.43 (1.54)	0.002
BUN	38.31 (25.65)	30.34 (20.58)	43.18 (27.32)	0.005
Albumin	3.45 (0.53)	3.65 (0.41)	3.32 (0.56)	0.001
LDH	407.43 (263.04)	343.92 (194.75)	446.85 (292.35)	0.043
CRP	13.67 (7.48)	11.15 (8.01)	15.15 (6.8)	0.016
WBC	7.32 (3.89)	6.49 (2.54)	7.84 (4.47)	0.043
ANC	5.31 (3.27)	4.53 (2.36)	5.82 (3.67)	0.025

Table 2: Clinical Risk Factors associated with severe AKI requiring hemodialysis

	All (118)	Dialysis (39)	No Dialysis (79)	P-Value
Commercial Insurance	66 (57.4)	14 (38.9)	52 (66.7)	0.008
ICU Admit	48 (45.3)	24 (72.7)	23 (31.9)	<.001
Ventilation	56 (47.9)	27 (71.1)	28 (35.9)	0.001
Creatinine at Admit	2.06 (2.03)	2.96 (3.14)	1.63 (0.93)	0.014
Phosphorus	4.02 (1.53)	4.67 (1.69)	3.57 (1.23)	0.008
BUN	38.31 (25.65)	47.45 (29.97)	32.91 (20.62)	0.009
Albumin	3.45 (0.53)	3.28 (0.55)	3.54 (0.51)	0.018
Age	64.56 (13.72)	59.39 (13.13)	67.03 (13.47)	0.005
LDH	407.43 (263.04)	539.89 (396.72)	350.94 (152.32)	0.021

Results

- 249 patients were hospitalized during the month of March who tested positive for SARS-COV-2 via RT-PCR nasopharyngeal swab.
- 118 (47%) patients developed AKI while admitted; the median age of these patients is 66 years old (AKI cohort)
- 45 (38%) of the AKI cohort had stage I AKI and 73 (62%) had high stage II/III AKI.
- 39 (33%) patients required dialysis. Of these, 36 (92%) had Stage III AKI. 2 (5%) dialysis patients had Stage II AKI and 1 (3%) had Stage I AKI.
- The following clinical variables were predictive for development of AKI:** ICU admin, age, ventilation, creatinine, phosphorus, BUN, albumin, LDH

Conclusions

- Half of the patients admitted to our institution in March with COVID-19 developed AKI.
 - Patients with COVID-19 who developed severe AKI were more like to be stepped up to the ICU, require mechanical ventilation, and overall experienced worse clinical outcomes**
 - Further studies are required to assess the long-effects of AKI on patients with COVID-19.
- Study Limitations:**
- This study was a retrospective analysis subjected to the shortcomings of conducting a chart review.
 - Although this study reveals one hospital's unique experience as a large, academic, safety net hospital, this is a single-center study that does not represent the entire city of New Orleans or Louisiana's experience with COVID-19.
 - While we obtained a minimum of 4 months of follow up on our study cohort, we were limited to viewing only the medical records within our hospital's network.