**Table 1.** Univariate and multivariate logistic regression analyses for AKI in hospitalized patients with COVID-19

	UNIVARIATE MODEL			MULTIVARIATE MODEL		
	Odds ratio	95% CI	P	Odds ratio	95% CI	P
Age, years	1.00	0.97–1.03	.960	0.96	0.91–1.01	.146
Male gender	0.87	0.32–2.33	.777	0.26	0.05–1.23	.090
Charlson index	1.11	0.90–1.38	.325	1.16	0.89–1.53	.266
Hypertension	2.79	1.13–6.88	**.025**	1.25	0.30–5.30	.759
Diabetes	0.56	0.14–2.29	.422			
Heart failure	1.19	0.25–5.70	.828			
Creatinine, mg/dL	4.84	1.23–29.13	**.026**	50.7	4.62–556.01	**.001**
RPA < 24 HU	2.22	0.86–5.74	.100	4.56	1.27–16.44	**.020**
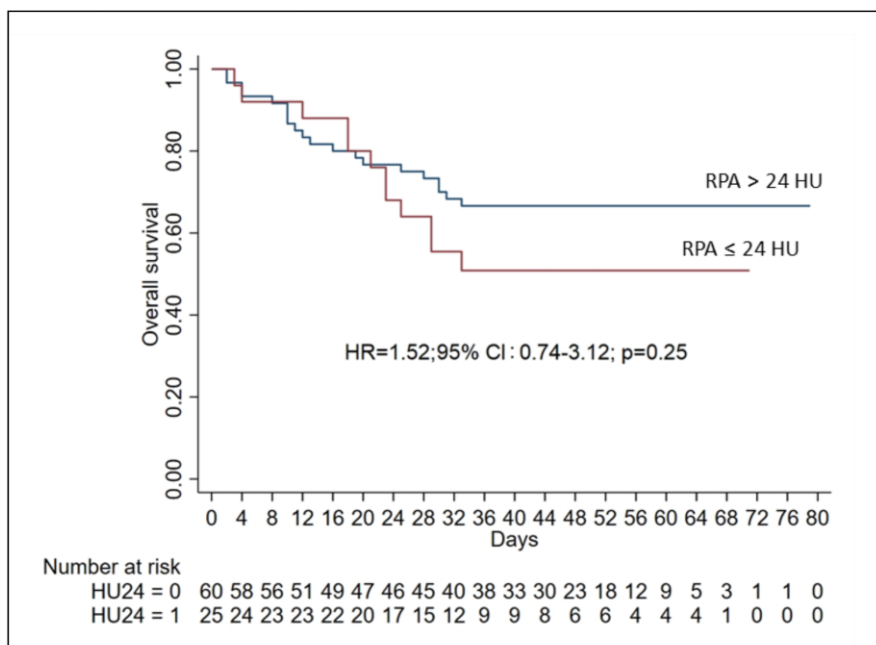
Abbreviations: HR, hazard ratio; CI, confidence intervals; RPA, renal parenchyma attenuation; HU, Hounsfield units.

FIGURE 1: Kaplan–Maier curves of survival for hospitalized COVID-19 patients on the basis of AKI-specific cut off of RPA.

and CCL-14 were also higher in the AKI group. Last, IgG response after SARS-CoV-2 vaccination was significantly lower in the AKI group.

CONCLUSION: AKI incidence was significantly increased during COVID-19 in respect to the pre-pandemic period, with an association with higher mortality in class 2–3 KDIGO. In the post-COVID follow-up, AKI was associated with lung and neuro-motor function impairment, a defective antibody response and a sudden GFR decline concomitant to the persistence of tubular injury biomarkers. These results suggest the importance of nephrological and multidisciplinary follow-up of frail patients who developed AKI during hospitalization for COVID-19.

MO330	AKI AND RENAL PARENCHYMA ATTENUATION IN HOSPITALIZED PATIENTS WITH COVID-19

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BACKGROUND AND AIMS: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) had a worldwide spread since early 2020 and a lot of studies concerning the diagnostic and prognostic role of chest computed tomography (CT) on coronavirus disease (COVID-19) has been published. Renal involvement might be present in up to 75% of cases, significantly impacting on the prognosis. The aim of this study is to clarify the role of opportunistic kidney assessment on non-enhanced chest CT and to evaluate if radiological findings could be associated with relevant clinical information regarding kidney function and patient's prognosis in hospitalized patients with COVID-19.

METHOD: We collected data on patient demographics, comorbidities, chronic medications, vital signs, baseline laboratory test results and in-hospital treatment in patients with COVID-19 consecutively admitted to our Institution who underwent chest CT. The standard chest CT-scan acquired in full inspiration include large part of both kidneys as per protocol. Three regions of interest (ROI) of 0.5–0.7 cm^2 were positioned in every kidney, right and left to include both the cortex and the medulla. The mean values of attenuation of kidney regions were analysed. The primary and secondary outcomes were the occurrence of acute kidney injury (AKI), in-hospital and 9 months of death for all causes.

RESULTS: A total of 86 patients with COVID-19 and unenhanced chest CT were analyzed splitting the cohort into CT renal parenchyma attenuation (RPA) quartiles. Patients with a CT RPA below 24 Hounsfield unit (HU) were more likely to develop AKI when compared with other patients ($\times 2 = 2.77$, $P = .014$). An AKI-specific cut-off point of RPA was identified by performing a survival receiver operating characteristic (ROC) curve. At multivariate logistic regression analysis, being in the first quartile of CT RPA was associated with a four-times higher risk of AKI (Table 1) after adjustment for age, gender, hypertension, kidney function at admission and other comorbidities. During a mean 22 ± 15 days of admission, 32 patients died (37.2%). Patients with lower values of RPA at CT (first quartile, <24 HU) were not at a higher risk of death compared with patients with RPA $\geq$ 24 HU, as shown by Kaplan Maier curve (Fig. 1) and by multivariate Cox regression analysis [HR 1.84 (95% CI 0.82–4.13); $P = .14$].

CONCLUSION: The association between AKI and RPA < 24 HU was independent of age, gender, creatinine and comorbidities. RPA values seemed to be predictive of AKI development in COVID-19 patients who underwent chest CT, suggesting RPA values could significantly improve patients' care. The opportunistic measure of RPA could help physicians identifying patients with a higher risk of AKI, and this increased awareness could guide choices for diagnostic and therapeutic procedures.

	No-AKI	AKI on arrival	AKI during admission	Total
n	391,518	2,547	25,786	419,851
Age (year)	63,6 (19,0)	74,8 (15,2)	77,9 (13,7)	64,6 (19,0)
Male (%)	49,5	55,7	55,6	49,9
Charlson Index (mediana, RIQ)	1 [0-2]	3 [1-4]	3 [1,4]	1 [0-2]
CKD stage 2 (%)	0,4%	1,2%	1,5%	0,4%
CKD stage 3 (%)	0,7%	6,6%	4,4%	1,0%
CKD stage 4 (%)	0,3%	7,0%	2,4%	0,5%
CKD stage 5 (%)	0,2%	4,2%	0,9%	0,3%
Unscheduled visit (%)	57,4	94	92,5%	59,8
Surgery admission (%)	44,7	4,4	16,6	42,7
Discharge_ at home (%)	93,8	87,8	77,3	92,8
Discharge_exitus (%)	3,5	9,3	18,8	4,5
Lengh at stay (days)	7,1 (9,6)	9,6 (9,4)	12,6 (13,7)	7,4 (10,0)
Readmission (%)	21,3	15,1	16,7	

*Data shown mean (standard deviation) or percentage.

FIGURE 1: Data patients, grouped by AKI situation (without AKI, AKI on arrival or AKI during admission).

MO331   **ACUTE KIDNEY FAILURE AS A RISK FACTOR FOR LONGER HOSPITAL STAY, RENAL REPLACEMENT THERAPY AND MORTALITY: A PUBLIC HEALTH SYSTEM ANALYSIS**

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BACKGROUND AND AIMS: Acute kidney failure (AKI) is a well-known risk factor in coronary care unit (CCU) and postoperative patients. We aim to analyse their role in a multicentre database (DB) from a public regional health system (6 million inhabitants).

METHOD: Observational, retrospective study, including all hospital admissions between January 2013 and December 2014 in all referral hospitals in Madrid. We grouped into three categories, admissions due to AKI (ON-AKI), AKI during stay (HOSP-AKI) secondary to other disease and admissions without AKI (no-AKI); ICD-9 code was 584. Admission from patients aged under 16, women to give birth or previous renal replacement therapy (RRT) were excluded. Study was approved by the ethics committee.

RESULTS: Of the 419 851 admissions registered in 2 years, 6.7% had an associated AKI (0.6% on arrival AKI and 6.1% during admission AKI). Patients admitted for AKI are older (ON-AKI: 74.8 years versus HOSP-AKI: 77.9 versus no-AKI: 63.6), with greater comorbidity (Charlson index 2.9 versus 3.1 versus 1.7); patients had more previous CV events (28.5% versus 46.8 versus 21.0), diabetes mellitus (34.1% versus 30.4 versus 17.1) and a higher prevalence of previous chronic kidney disease-CKD (41.3 versus 31.5 versus 4.9%). AKI kidney failure lengthens hospital stay by 3.2 days 95% confidence interval (95% CI) (2.8–3.5) after adjust by age, gender, Charlson index, surgery and major diagnostic categories.

Admissions with AKI are usually unscheduled and have a longer hospital stay (9.6 ON-AKI versus 12.6 HOSP-AKI versus 7.1 days in no-AKI admission). More patient died during hospital stay in AKI group (14.4% ON-AKI; 22.9 HOSP-AKI versus 3.5% No-AKI) and although 4.3% of admission needed dialysis, only 0.5% started a chronic RRT during admission.

Principal risk factor for developing secondary AKI ($R^2 = 16\%$) is previous CKD [OR 3.6; (3.48–3.74)], after corrected by age, male, the Charlson index and non-surgical admission.

Mortality risk for patients with an admission for AKI ($R^2 = 17\%$), corrected for age, sex, comorbidity, previous CKD, and type of admission is OR: 1.8 95% CI (1.57–2.08); secondary AKI is OR 3.73 (3.59–3.88) than no-AKI admission.

CONCLUSION: AKI is a huge burden for health system and patients, and associates significant longer stay, cost and a higher mortality. Main factor to develop secondary AKI is age and previous CKD.

MO332   **ACUTE KIDNEY INJURY IS ASSOCIATED WITH POOR LONG-TERM OUTCOMES IN HOSPITALIZED PATIENTS WITH COVID-19**

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BACKGROUND AND AIMS: The acute effects of the acute kidney injury (AKI) on short-term mortality in patients with novel coronavirus infection (COVID-19) have been studied, but the long-term outcomes after COVID-19-associated AKI are not well understood. Our aim was to evaluate the impact of AKI in acute COVID-19 in the prediction of long-term mortality in a population of hospitalized patients with COVID-19.

METHOD: We performed a cohort study on 1000 patients hospitalized from April to July 2020 with laboratory-confirmed COVID-19 and lung injury by computer tomography (CT). We excluded patients with re-hospitalization, acute surgical pathology and a single serum creatinine measurement during hospitalization. Definition of AKI was based on KDIGO criteria. According to the ESC guidelines, the term acute decompensated heart failure (ADHF) is used to describe patients with previously history of chronic stable heart failure with the typical symptoms and/or signs of decompensation of HF during hospitalization. Multivariate Cox regression was conducted to explore the potential predictors for long-term mortality. A P-value < 0.05 was considered statistically significant.

RESULTS: The prospective part included 691/792 (87%) surviving patients [47% males, mean age 67 (55;78) years, mean Charlson index 3 (2;5), 69% with hypertension (HTN), 50% with obesity, 26% with diabetes mellitus (DM) and 15% with coronary artery disease (CAD)]. And 12.6% of patients were hospitalized in the intensive care unit (ICU).

A total of 137 (20%) patients had AKI in acute COVID-19 and discharged from the hospital. The majority of survival patients with AKI had the 1 stage (77%), 17%––the 2 and 6%–the 3. There were no patients who underwent renal replacement therapy during acute COVID-19 in the survivors' group. Patients with AKI were older [71 (62;78) versus 64 (52;73) years, P < .0001, compared with patients without AKI], had HTN (83% versus 66%, P < .001), DM (33% versus 24%, P = .03), CAD (25% versus 13%, P < .001) and higher Charlson index [4 (3;5) versus 3 (1;4), P < .0001]. Also, AKI patients had more severe lung injury by CT in acute COVID-19 (lung injuries >50%, 38% versus 26%, P = .004) and more frequently were hospitalized in ICU (23% versus 10%, P < .001). A total of 74% patients recovered from AKI at the discharge time.

During 180 days of follow-up, 41 (6%) patients died in the whole study group. The most common cause of death was a heart attack or stroke (29%). In the group without AKI, the mortality rate was 4.5%, among patients with AKI—11.8% (P < .001). In multivariate Cox regression, AKI in the acute phase of COVID-19 [hazard ratio (HR) 2.83, 95% confidence interval (95% CI) 1.28–6.26; P = .01] and the Charlson