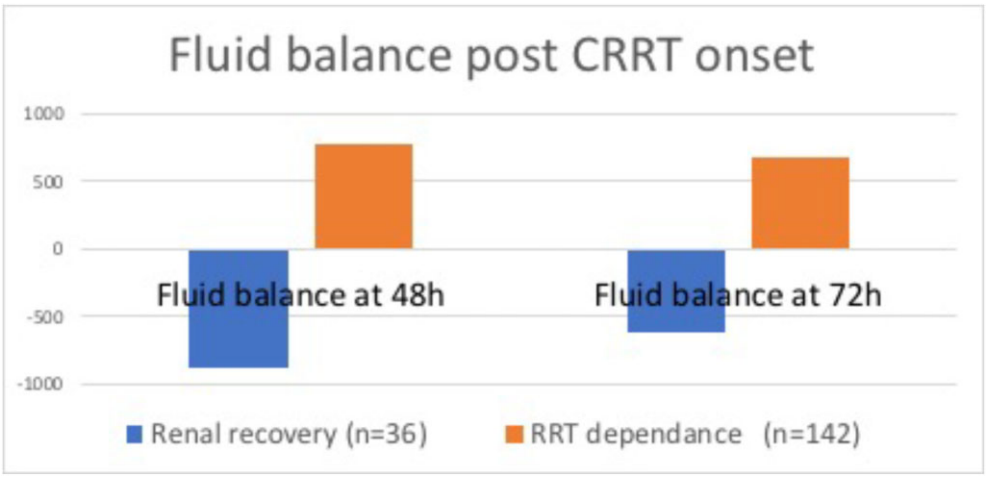

haemodynamic support (OR 4.37, 95% CI 2.14–8.92; $P < .01$). Otherwise, lower SCr at admission (OR 0.82, 95% CI 0.71–0.93; $P < .01$) and at instauration of RRT (OR 0.75, 95% CI 0.065–0.88; $P < .01$) were associated to lower mortality.
In COVID patients, fluid overload at RRT initiation (OR 10.83, 95% CI 1.37–85.36; $P = .02$), age > 65 year old (OR 8.85, 95% CI 2.68–29.1; $P < .01$) and FiO2 > 50% at RRT start (OR 2.77, 95% CI 1.02–7.50; $P = .04$) were associated to higher mortality.
CONCLUSION: In ICU patients with AKI-RRT dependence, negative fluid balance at 48 h after RRT onset and in COVID patients, age < 65 year old, negative fluid balance at 48 h after RRT onset and non-urgent onset of RRT were related with renal recovery.

MO337 HIGHER ANTIBODY RESPONSE AFTER 2 VACCINATIONS WITH MRNA-1273 AS COMPARED WITH BNT162B2 AND AZD1222 IN HIGH-RISK KIDNEY PATIENTS

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BACKGROUND AND AIMS: Lower antibody responses after SARS-Cov-2 vaccination have been reported in patients with severely impaired kidney function or patients with kidney replacement treatment. We compared humoral responses and reported adverse events of three vaccines (mRNA-1273, BNT162b2 and AZD1222) in kidney transplant recipients (KTRs), dialysis patients, patients with CKD stages G4–G5 and control subjects without kidney disease.
METHOD: KTRs, dialysis patients and patients with CKD stages G4–G5 were vaccinated with either mRNA-1273, BNT162b2 or AZD1222 during the Dutch SARS-CoV-2 vaccination program. Control subjects were all vaccinated with mRNA-1273. Blood samples were obtained at 1 month after two vaccinations by home-based finger prick tests and were analysed for the presence of IgG antibodies against the receptor-binding domain of the spike protein of SARS-CoV-2 using the Sanquin anti-SARS-CoV-2 RBD IgG ELISA assay. Primary endpoints were the antibody titer and reported systemic adverse events (AEs) at 1 month after the second vaccination. Multivariate regression analysis was performed on the difference between vaccines with respect to antibody titer and AEs after correction for sex, ethnicity, BMI, eGFR, dialysis vintage, transplantation characteristics and use of immunosuppressive drugs.
RESULTS: A total of 2468 KTRs, 480 dialysis patients, 400 patients with CKD stages G4–G5 and 186 control subjects were enrolled. KTRs had lower antibody titers (66 [8–573] BAU/mL) in comparison to dialysis patients [1375 (431–2896) BAU/mL], patients with CKD stages G4–G5 [2097 (828–4077) BAU/mL] and control subjects [3713 (2291–6451) BAU/mL]. mRNA-1273 demonstrated a higher antibody titer compared with BNT162b2 in KTR [72 (9–638) versus 21 (6–128) BAU/mL; $P < .001$), dialysis patients [1675 (573–3031) versus 636 (216–1416) BAU/mL; $P < .001$] and patients with CKD stages G4–G5 [2879 (1425–5311) versus 1063 (389–1939) BAU/mL; $P < .001$). In a similar pattern, mRNA-1273 demonstrated a higher antibody titer compared with AZD1222 ($P < .001$ in all groups). Multivariate analysis revealed that BNT162b2 and AZD1222 were significantly associated with lower antibody levels compared with mRNA-1273 in all 3 patient groups. BNT162b2 demonstrated less frequently systemic AEs compared with mRNA-1273 in KTRs (12% versus 27%; $P < .001$), dialysis patients (12% versus 29%; $P = .007$) and in patients with CKD G4–G5 (18% versus 67%, $P < .001$). AZD1222 demonstrated less systemic AEs compared with mRNA-1273 only in patients with CKD stages G4–G5 (39% versus 67%; $P = .03$). Multivariate analysis revealed that BNT162b2 was associated with fewer systemic AEs in only dialysis patients ($P = .04$) and patients with CKD stages G4–G5 ($P = .02$).
CONCLUSION: mRNA-1273 demonstrated significantly higher antibody levels at 1 month after 2 vaccinations as compared with BNT162b2 and AZD1222 in high-risk patients with kidney disease. BNT162b2 was associated with a fewer systemic AEs in dialysis patients and patients with CKD stages G4–G5, although these AEs were mild and self-limiting. mRNA-1273 may therefore be considered as the preferred SARS-CoV-2 vaccine in high-risk patients with kidney disease. Whether the higher antibody response following vaccination with mRNA-1273 sustains and results in a better protection against COVID-19 is yet to be analysed.

MO338 LONG-TERM KIDNEY OUTCOMES AFTER ACUTE KIDNEY INJURY IN PATIENTS WITH COVID-19

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BACKGROUND AND AIMS: The acute effects of the novel coronavirus infection (COVID-19) on short-term kidney outcomes have been studied, the long-term kidney outcomes after COVID-19-associated acute kidney injury (AKI) in comparison with hospitalized patients without AKI are insufficiently researched. Our aim was to evaluate the impact of AKI in acute COVID-19 on long-term kidney outcomes in 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. In the prospective part, patients with serum creatinine measurement within 180 days after discharge were included. Definition of AKI and chronic kidney disease (CKD) were based on KDIGO criteria. *P*-value <0.05 was considered statistically significant.
RESULTS: The prospective part included 446/792 (56%) surviving patients [47% males, mean age 66 (57;74) years, mean Charlson index 3 (2;5), 74% with hypertension (HTN), 51% with obesity, 28% with diabetes mellitus (DM), 17% with coronary artery

disease (CAD) and 14% with chronic kidney disease (CKD)]. 13% of patients were hospitalized in the intensive care unit (ICU).
A total of 103 (23%) of discharge patients had AKI in acute COVID-19. The majority of patients with AKI had the stage 1 (84%), 9% had the stage 2 and 7% had the stage 3. There were no patients who underwent renal replacement therapy during acute COVID-19 in the survivors' group.
Patients with AKI were older [71 (61;76) versus 65 (56;73) years; $P = .006$, compared with patients without AKI], more frequently had higher Charlson index [4 (3;5) versus 3 (2;4); $P = .0002$], CAD (25% versus 15%; $P = .02$) and CKD (20% versus 12%; $P = .04$) before hospitalization. There were no differences in the frequency of HTN and DM. Also, AKI patients had more severe lung injury by CT in acute COVID-19 (lung injury >50%: 36% versus 23%; $P = .005$), more frequently were hospitalized in ICU (25% versus 10%; $P < .001$) and were treated with mechanical ventilation (15% versus 4%; $P < .001$).
At discharge 27% patients did not recover from AKI. The mean serum creatinine level at discharge was 93 (77;114) mmol/L in patients with AKI and 81 (70;94) mmol/L in patients without ($P < .0001$), mean glomerular rate filtration (GFR) CKD-EPI 2012 was 65 (50;81) versus 75 (62;91) mL/min, respectively ($P < .0001$). Mean serum creatinine level after 180 days of follow-up was 94 (74;117) mmol/L in patients with AKI and 78 (66;92) mmol/L in patients without ($P < .0001$), mean GRF was 65 (49;82) versus 80 (63;94) mL/min, respectively ($P < 0.0001$).
After 180 days of follow-up, the frequency of CKD was statistically higher in both groups compare with time before COVID-19, especially in patients with AKI in acute COVID-19 (47% versus 23%; $P < .001$). Patients with AKI more frequently had CKD de novo (27% versus 11%; $P< .001$) and a reduction of GFR CKD-EPI by 30% compared with GFR at discharge (18% versus 4%; $P < .001$) after 180 days of follow-up.
CONCLUSION: In this study, patients who survived COVID-19 had an increased risk of poor long-term kidney outcomes. Patients after COVID-19-associated AKI had worse kidney outcomes. Post-acute COVID-19 care should include attention to kidney disease.

MO339 THE EFFECT OF PRE-ADMISSION ANGIOTENSIN-CONVERTING ENZYME INHIBITOR (ACEI) AND ANGIOTENSIN RECEPTOR BLOCKER (ARB) USE ON THE INCIDENCE OF ACUTE KIDNEY INJURY AND MORTALITY IN PATIENTS WITH SEPTIC SHOCK

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BACKGROUND AND AIMS: In the early stages of sepsis, the renin–angiotensin–aldosteron system (RAAS) is activated despite adequate volume resuscitation. Overactivity of RAAS might contribute to an inferior outcome in patients with severe sepsis, therefore modulation of RAAS could be beneficial in preventing organ failure and reducing mortality. Recommendation to discontinue angiotensin convertase enzyme inhibitors (ACEI) and angiotensin receptor blockers (ARB) for the prevention of acute kidney injury (AKI) in these patients is currently controversial.
In this retrospective cohort study, we aimed to study the potential effect of pre-hospital ACEI or ARB use on the incidence of AKI and mortality in patients admitted to the intensive care unit (ICU) with septic shock.
METHOD: A total of 536 patients admitted to a single ICU for septic shock during a 5-year period were selected for inclusion in the study. Pre-admission ACEi/ARB exposure was extracted from the admission documents. Propensity score matching based on age, gender, diabetes, hypertension and cardiovascular disease (CVD) was used to control for baseline differences between ACEi/ARB treated and control patients. Stages of AKI were defined according to the KDIGO criteria, using the first available creatinine level as a baseline. Since ACEi/ARB therapy was discontinued after admission, AKI was only considered within the first 3 days of admission. The incidence of AKI stages was compared between treated and control patients. In addition, multivariate logistic regression models were used to assess the association between ACEi/ARB use and mortality in the ICU.
RESULTS: A total of 241 treated and 274 control patients were identified after matching. The mean age was 71 ± 9 years, 42% were female, the prevalence of diabetes and CVD were 36% and 72%, respectively. As expected, baseline GFR on admission in the treated group was lower compared with control: 37 mL/min versus 49 mL/min; $P = .005$. The incidence of AKI was similar in both groups: 25 versus 28%; $P = .593$. The somewhat higher proportion of patients with AKI stage 1 in the treated group (6.6% versus 3.3%) did not reach statistical significance ($P = .170$). This most likely reflects the glomerular hemodynamic effect of RAS inhibition. The incidence of stage 2 and 3 AKI was comparable in treated (19.1%) and control groups (25.4%, $P = .233$). Patient survival was similar in both groups: 63.1% versus 58.6%; $P = .461$.
In the whole cohort of 536 patients, only baseline GFR remained an independent predictor of AKI stage 2 or 3 (OR 1.6 for 10 mL/min decline; $P < .001$) in the multivariate analysis. AKI stage 2 and 3 (OR 3.324; $P < .001$) and cardiovascular disease (OR 2.288; $P = 0.003$) were independent predictors of mortality. ACEi/ARB exposure was not associated with patient outcome in our cohort.
CONCLUSION: In this retrospective cohort study, we confirmed that pre-admission ACEi/ARB use was not associated with a higher risk of AKI in patients with septic shock admitted to the ICU. Our results suggest that ACEi/ARB treatment could be continued until the patient's blood pressure allows in early stages of sepsis.

MO340 ACUTE KIDNEY DISEASE IN THE OUTPATIENT SETTING: FROM BIG DATA PHENOTYPING TO BIOMARKER VALIDATION USING THE NGAL AND DNLITE-IVD103 TESTS

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BACKGROUND AND AIMS: Acute kidney injury (AKI) and acute kidney disease (AKD), a typical inpatient disease spectrum, pose an exceptional burden on the current healthcare system worldwide. By contrast, developing operative diagnostic criteria for AKD in the outpatient setting (AKD_{OPT}) remains an unattained goal due to the data silos built around the disconnected healthcare systems. In 2017, Taiwan launched the National Cloud-based Health Information Exchange Platform and established the interoperability standard that makes the automated monitoring of change of serum creatinine (S-Cre) in the outpatient setting a possible practice. This study aims to verify our previously proposed AKD_{OPT} diagnostic algorithms using both the conventional neutrophil gelatinase-associated lipocalin (NGAL) and DNlite-IVD103 tests, detecting a novel biomarker, a post-translational modified (PTM) fragment of Fetuin-A [1, 2].
METHOD: The Big Data Center of China Medical University Hospital (CMUH) has launched the Acute Kidney Injury Detection System (AKIDS) in the outpatient setting since December 2017 based on our AKD_{OPT} diagnostic algorithms (Fig. 1). In November 2020, we conducted a pragmatic randomized trial to evaluate the clinical effectiveness of AKIDS in reducing the risk of AKD_{OPT} progression to dialysis. Among patients who participated in this trial, both urine and blood were obtained at the enrollment and the urine samples were sent for the quantification of NGAL and the unique PTM-Fetuin-A fragment, an ELISA test developed by Bio Preventive Medicine (BPM). The risk of S-Cre doubling was estimated by Firth's logistic regression.
RESULTS: A total of 56 patients who were captured by the AKIDS and with the last estimated glomerular filtration rate (eGFR) below 45 mL/min/1.73 m^2 recruited in this trial with a median age of 73 years (IQR: 66.2–82.5) and a baseline eGFR of 36.4 (IQR: 21.0–46.3) mL/min/1.7 3 m^2. During the follow-up, there were six participants reached the S-Cre double status. The median levels of NGAL and IVD103 were 1360 (IQR: 299–1827) ng/mg and 74.7 (IQR: 37.3–236) ng/mg, respectively, among patients experiencing the endpoint, and they were 187 (81.4–1152) ng/mg and 15.9 (6.16–67.3) ng/mg for patients free of the primary outcome. The odds ratios of the S-Cre doubling for each log unit increase in NGAL and IVD103 were 2.26 (95% confidence interval 0.73–6.98; *p*-value .16) and 3.48 (0.78–15.6; *p*-value .10), respectively. In the dose-response plot, we found only IVD103 showed a positive linear relationship with the risk of S-Cre doubling despite the two biomarkers showed comparable area under the receiver operating characteristic curve for predicting poor kidney outcome (NGAL 0.697 versus IVD103 0.723).
CONCLUSION: This is the first study to phenotypically validate the previously unrecognized phenotype, AKD_{OPT}, by the AKIDS developed under the National Health Insurance (NHI) information technology infrastructure and molecularly validate its prognostic role using kidney injury biomarkers, NGAL and a novel eGFR decline prediction biomarker, a unique PTM-fragment of Fetuin-A (IVD103). The linear association between IVD103 and the risk of S-Cre doubling supports its prognostic value in the risk assessment of AKD_{OPT}.

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