

PRESS RELEASE

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Acute kidney disease in critically ill COVID-19 patients

Characterization of COVID-19-associated acute kidney injury (AKI) and acute kidney disease (AKD) with regard to incidence, severity, clinical presentation and short-term outcomes.

ABSTRACT: A current study [1] is the first to evaluate and characterize the occurrence of COVID-19-associated acute kidney injury (AKI) in a larger number of critically ill patients. The study has been published in CKJ. AKI developed in a total of 80% of the patients after admission, and day 14 renal recovery occurred in only 52% of those affected.

71 patients with severe lung injury were admitted to four intensive care units at Bordeaux University Hospital and their data were collected and evaluated over a period of six weeks (March/April 2020). AKI was defined using KDIGO criteria and ADQI according to the Acute Disease Quality Initiative (ADQI) 16 workgroup.

On admission as in-patients, patients' basal serum creatinine was 69 ± 21 $\mu\text{mol/l}$ on average (normal is up to 100 $\mu\text{mol/l}$, approximately, depending on test procedure); AKI was present in 8/71 patients (11%) at that time. The median follow-up was 17 (12-23) days; AKI developed in a total of 57/71 patients (80%), with 35% Stage 1, 35% Stage 2 and 30% Stage 3; of those patients, 18% (10/57) required renal replacement therapy (dialysis). Two of the 57 patients died within the first 72 hours.

After three days, creatinine had fallen again in four of the remaining 55 patients (7%), indicating transient AKI. 51/55 patients (93%) had persistent AKI with increased protein excretion [median urinary protein/creatinine ratio of 82 (54-140) mg/mmol and albuminuria/proteinuria ratio of 0.23 ± 20] – indicating predominantly tubulo-interstitial injury. Only two patients (4%) had elevated glucose excretion (glycosuria). Seven days after AKI development, six patients (11%) were still on dialysis, nine (16%) had serum creatinine $>200 \mu\text{mol/l}$, and a further four (7%) had died. Renal recovery occurred in 28% after seven days and in 52% after 14 days.

Reports from China indicate acute kidney injury in up to 15% of intensive-care COVID-19 patients [2], the kidney being the second most frequently damaged organ. In the U.S.A., AKI is observed in 20% of subjects [3]. The authors' hypothesis that these figures could be significantly higher in Western Europe was strongly verified by the study.

"Kidney involvement in critically ill COVID-19 patients was very common, at 80%, with AKI lasting longer than three days in most cases and almost one in five of those having to be dialyzed," commented Dr. Sébastien Rubin, Bordeaux. "This high rate of COVID-19-associated AKI cases is startling and shows how renotropic this novel virus can be."

"10% (6/57) of patients with AKI died and almost half the patients had still not shown renal recovery even after two weeks. That is, they had AKD", is a point emphasized by Professor Alberto Ortiz, editor-in-chief of CKJ, the official open access journal of the ERA-EDTA. "This study underscores the importance of follow-up nephrological care of patients after discharge from hospital. It is well known that AKI patients have a higher risk of developing CKD and ESRD later on, and good nephrological follow-up can prevent or at least slowdown that process."

[1] Rubin S, Orieux A, Prevel R et al. Characterisation of Acute Kidney Injury in Critically Ill Patients with Severe Coronavirus Disease-2019 (COVID-19). *Clinical Kidney Journal* 2020; <https://academic.oup.com/ckj/advance-article/doi/10.1093/ckj/sfaa099/5854260>

[2] Zhou F, Yu T, Du R et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet* 2020; 395 (10229): 1054-1062. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)30566-3/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30566-3/fulltext)

[3] Bhatraju PK, Ghassemieh BJ, Nichols M et al. Covid-19 in Critically Ill Patients in the Seattle Region — Case Series. *The New England Journal of Medicine*. March 2020. <https://www.nejm.org/doi/full/10.1056/NEJMoa2004500>

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