



## ACUTE KIDNEY INJURY IS ASSOCIATED WITH INCREASED IN-HOSPITAL MORTALITY AND WITH IMPAIRMENT OF KIDNEY, LUNG AND MOTOR FUNCTION AFTER DISCHARGE FOR COVID-19

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### Background and aims:

Acute Kidney Injury (AKI) is the most frequent complication after respiratory failure in COVID-19. AKI increases mortality risk, length of hospital stay and healthcare costs with possible progression toward Chronic Kidney Disease (CKD) with an acceleration of renal aging mechanisms. Moreover, AKI leads to acute and chronic dysfunction of distant organs (heart, brain, etc.) with the development of severe comorbidities. Study aims: 1) evaluation of AKI incidence in 1020 COVID-19 hospitalized patients; 2) comparison of AKI incidence in COVID-19 vs. pre-pandemic period; 3) establishment of out-patient follow-up for monitoring kidney, lung and motor function; 4) creation of a biobank for biomarker discovery studies.

### Methods:

AKI incidence was calculated matching laboratory and administrative data of 26214 hospitalized patients in 2018-2019 and in 1020 COVID-19 patients in 2020-2021: KDIGO algorithms were applied for AKI grading. After 12 months from discharge, 232 COVID AKI patients and relative controls matched for age and gender were evaluated for kidney (eGFR, biomarkers of tubular damage NGAL, CCL-14, DKK-3), lung (DLCO, CT scan) and neuro-motor (SPPB, 2-min walking test) function.

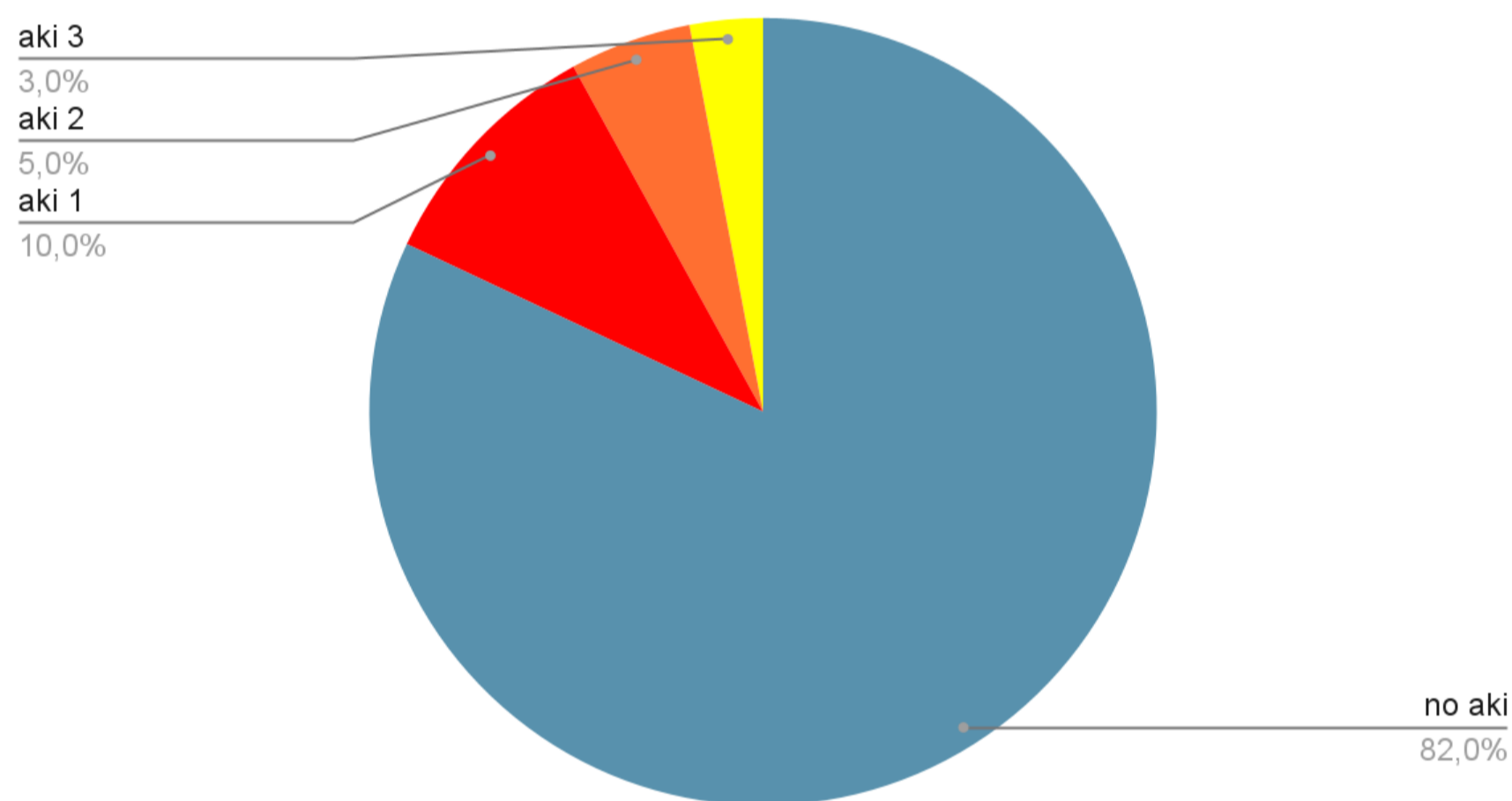
### Results:

Before pandemic, in-hospital AKI incidence was 18% (10% KDIGO 1, 5% KDIGO 2, 3% KDIGO 3): median age of AKI patients was 69. In-hospital mortality was 3.5 % in non-AKI group vs. 15% in AKI group in accordance with KDIGO stages. In COVID patients, AKI incidence increased to 37% (20% KDIGO 1, 11% KDIGO 2, 6% KDIGO 3): median age of patients was 54. In-hospital mortality was 31 % in AKI group. After 12 months from hospital discharge, COVID AKI patients showed a persistent reduction of respiratory function (severe DLCO impairment <60%) related to the extent of CT scan abnormalities. AKI patients also presented motor function impairment. GFR reduction was 1.8 ml/min in non-AKI vs. 9.7 ml/min in AKI COVID patients not related to age. Urinary DKK-3 and CCL-14 were also higher in the AKI group.

### Conclusion:

AKI incidence was significantly increased during COVID-19 in respect to 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 and with a sudden GFR decline concomitant to the persistence of tubular injury biomarkers. These results suggest the importance of a nephrological and multidisciplinary follow-up of these frail patients. Moreover, AKI is an accelerator of renal and distant organ aging that should be carefully avoided during hospitalization for COVID-19.

pre pandemic era - AKI incidence



pandemic era - AKI incidence

