

## The impact of COVID-19 on right ventricular function in chronic kidney disease patients

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**Introduction:** In chronic kidney disease (CKD) patients, the case fatality rate caused by the severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) is higher than in the general population [1]. In patients hospitalised with COVID 19, right heart dysfunction is present in 20% of the cases, associated with an increased risk of all-cause death [2].

**Purpose:** CARDIO-SCARS in CKD is a currently ongoing multi-center observational match controlled trial that aims to assess the cardiovascular (CV) risk in a CKD (stages 3 to 5), dialysis and kidney transplant population, following SARS-CoV-2 infection, by using clinical evaluation, various techniques and novel biomarkers (ClinicalTrials.gov Identifier NCT05125913). We hereby report the main baseline echocardiographic parameters that assess the right ventricular (RV) function.

**Methods:** We conducted a cross-sectional study that included 263 patients with CKD (dialysis, transplantation or eGFR <60 ml/min/1.73 m<sup>2</sup>). For assessing RV function, 5 parameters were measured: fractional area change (FAC, %), tricuspid annular plane systolic excursion (TAPSE, mm), tricuspid S' wave (S tric, cm/s), Tei index and right ventricular free wall longitudinal strain (RVFWLS, %). Patients in atrial fibrillation, with a permanent pacemaker or with a poor acoustic window were excluded.

**Results:** Our study included 263 patients with CKD, divided in two groups: 168 patients post COVID-19 (94 in dialysis, 38 post kidney transplantation

and 36 with CKD) and 95 patients in the control group (57 in dialysis, 30 post kidney transplantation and 8 with CKD). The mean age was 57.3±15.4 years (median 60 years old), 55.2% of the patients were males, 24% were diabetic and 9.5% were smokers. The mean duration of dialysis in the COVID-19 group was 63.8 months vs. 62.6 months in the control group. In the COVID group, the echocardiography was performed at a mean distance of 2.2±2.1 months after testing positive for SARS-CoV-2. All the parameters of RV function were better in the control group (FAC (%): 43.6±11 vs. 41.3±11; TAPSE (mm): 23.2±6.9 vs. 21.4±4.9; S tric (cm/s): 13.4±3.4 vs. 13±3.1; Tei index: 0.5±0.2 vs. 0.6±0.2; RVFWLS (%): -20.1±3.8 vs. -18.6±5.1. After performing a two-sample t-Test, statistical significance was reached only for TAPSE, Tei index and RVFWLS (0.008, 0.0001 and 0.006, respectively).

**Conclusions:** Our study is the first to describe echocardiographic alterations post-COVID in a CKD population. All CKD patients had lower values of RV parameters than those reported in the general population. Still, the CKD COVID group had lower values than CKD control group, with the same magnitude as the changes reported in the general population [3,4]. The evolution of these parameters and their prognostic significance is of interest, regarding long-term CV sequelae of COVID-19.