



**Short Scientific report on the implementation of the project
PN-III-P4-ID-PCE-2020-2393 (contract no. 204PCE/2021) entitled
“ Long term Cardio-Vascular risk assesment in CKD patients following SARS-COV-2
disease – CARDIO SCARS IN CKD”, Phase 2-2022**

Project Code: PN-III-P4-ID-PCE-2020-2393

Project manager: Prof. Univ. Dr. Adrian C. Covic

Host institution: Grigore T. Popa University of Medicine and Pharmacy of Iași

Phase-2022. Clinical and biological evaluation. FMD, PWV, IMT, BIS analysis. Cardiac and lung echography. Statistical analysis.

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).

The coronavirus disease 2019 (COVID-19) caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is produced by binding to angiotensin-converting enzyme, which among other sites is highly expressed in the endothelial cells of the blood vessels, pericytes and the heart, as well as in renal podocytes and proximal tubular epithelial cells. SARS-COV-2 and cardiovascular disease (CVD) are interconnected by risk factors association with an increased incidence of the disease and by determining de novo cardiac complications. At the same time, COVID-19 disease can lead to acute kidney injury directly, or due to sepsis, multi-organ failure and shock. Therefore, the preexistence of both CVD and chronic kidney disease (CKD) is associated with a higher risk of severe disease and worse prognosis. Taking all this into account, the main aim of study is to holistically assess the CV risk in a CKD population, following COVID-19 SARS-CoV-2 infection, with focus on the endothelial dysfunction as compared to a control group of matched CKD patients, by using clinical evaluation, flow-mediated dilatation, carotid-femoral pulse wave velocity, intima-media thickness, echocardiographic parameters, lung ultrasound, bioimpedance spectroscopy and a series of novel biomarkers, in order to determine the long-term impact of this disease on CV and renal outcomes.

This study includes all patients admitted to the *Dr. C. I. Parhon* Hospital of Iasi and follows the below flow-chart.

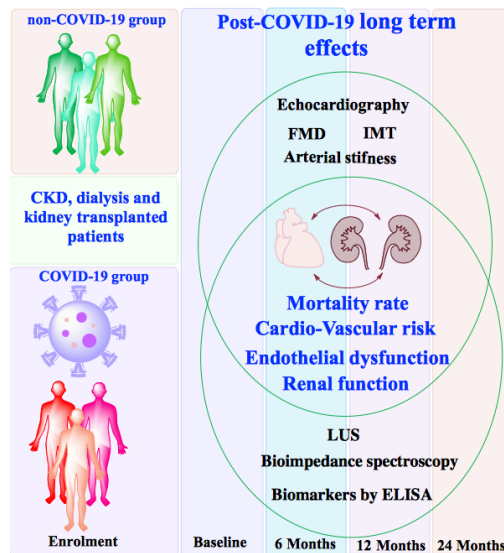


Figure 1. CARDIO SCARS IN CKD flow-chart

Performed activities:

2.1. Clinical and biological evaluation at 1-year follow-up.

At 1-year follow-up, defined as T1, the included patients have a complete clinical and paraclinical evaluation. At each evaluation, serum samples are collected and stored at -80°C for future biomarker analysis.

Table 1. General characteristics of the population

	COVID-19 group n=168 (57,9%)	Control group n=122 (42,1%)	p value
Men n (%)	90 (53,6%)	70 (57,4%)	0,52
Age mean	58,5 +/- 14,8	53,7 +/- 14,9	0,007
Hypertension	136 (81%)	92 (75%)	0,256
Diabetes	52 (31%)	18 (14,8%)	0,001
Atrial fibrillation	33 (19,6%)	14 (11,5%)	0,062
Heart failure	80 (47,6%)	34 (27,9%)	0,001
Ischemic cardiopathy	51 (30,4%)	19 (15,6%)	0,004
Chronic pulmonary conditions	8 (4,8%)	6 (4,9%)	0,951
Smokers	13 (7,7%)	19 (15,6%)	0,036
Mean duration from SARS-COV-2 infection (months)	2,26 +/- 2,14	-	-

2.2. FMD, PWV, IMT, BIS analysis at T1 for all included patients.

2.3. Cardiac and lung echography at T1 for all included patients.

2.4. Statistical analysis.

✚ Dissemination and exploitation plan:

- **Clinical Trial:** ClinicalTrials.gov Identifier: NCT05125913

- **Publications ISI:**

- Tapoi, L., Apetrii, M., Dodi, G., Nistor, I., Voroneanu, L., Siriteanu, L., Onofriescu, M., Kanbay, M., Covic, A. Long-term Cardio-Vascular risk assessment in chronic kidney disease and kidney transplanted patients following SARS-COV-2 disease: protocol for multi-center observational match controlled trial, BMC Nephrology (2022) 23:176, <https://doi.org/10.1186/s12882-022-02809-4>

- Tapoi, L., Ureche, C., Diaconu, A., Vasiliu, V., Siriteanu, L., Andrian, T., Stefan, A., Baluta, C., Apetrii M., Dodi, G., Nistor, I., Onofriescu, M., Sascau, R., Statescu, C., Covic, A. The impact of COVID-19 on right ventricular function in chronic kidney disease patients, European Heart Journal, Volume 43, Issue Supplement_2, October 2022, ehac544.063, <https://doi.org/10.1093/eurheartj/ehac544.063>

- **Conferences:**

- Oral presentation at 59th ERA Congress, May 19-22, 2022, Paris, France;
- Poster presentation at ESC Congress 2022, August 26-29, 2022, Barcelona, Spain.