

Biventricular myocardial function in Covid-19 recovered patients assessed by speckle tracking echocardiography: a prospective cohort echocardiography study

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Introduction: Although severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causes respiratory disease and affects primarily the lungs, it may also lead to cardiovascular complications and late manifestations like myocarditis, arrhythmias and myocardial damage. Nevertheless, it is not clear whether cardiovascular involvement remains after Covid-19 recovery. Two-dimensional speckle tracking echocardiography (2D-STE) can detect subclinical myocardial dysfunction, if present, and has been widely used for left (LV) and right (RV) ventricular function assessment in several clinical conditions.

Purpose: The aim of our study was to evaluate prospectively myocardial systolic function and hence cardiac involvement in patients after the recovery from Covid-19, using 2D-STE.

Methods: 100 Covid-19 recovered patients with preserved left ventricular ejection fraction (LVEF), were prospectively recruited from March 2021 until June 2021 at the General hospital of Korinthos and at the General hospital of Elefsina, "Thriassio". Based upon clinical manifestation of the disease, they were divided into two groups, those with mild symptoms, who were treated ambulant and those with respiratory insufficiency who were hospitalized. Conventional echo parameters as well as LV global longitudinal strain (LVGLS), regional strain of all LV walls and right ventricular global longitudinal strain (RVGLS) were measured in all patients and compared to controls.

Results: The mean time of performed echo examination of all patients was 33.28 ± 9.4 days after the initial confirmed covid-19 infection diagnosis. Although overall LV systolic function expressed by EF was normal and similar to controls, LVGLS was found to be significantly lower in Covid-19 recovered patients in compare to controls (-18.47 ± 2.4 vs $-21.07 \pm 1.76\%$ respectively, $p < 0.0001$). More specifically, it seemed that especially the lateral wall longitudinal strain (LATLS) and posterior wall longitudinal strain (POSTLS) were significantly reduced in all patients compared to controls (-17.77 ± 3.48 vs $-20.97 \pm 2.86\%$ respectively, $p < 0.0001$ for LATLS and -19.52 ± 5.3 vs $-22.23 \pm 2.65\%$ respectively, $p = 0.01$ for POSTLS). RVGLS was found significantly diminished only in the hospitalized group of Covid-19 recovered patients, compared to controls (-21.29 ± 5.58 vs $-26.03 \pm 4.55\%$ respectively, $p < 0.0001$).

Conclusions: LVGLS is affected in almost all individuals after covid-19 infection independently of the infection severity, with LATLS being the most sensitive marker of LV impairment and with POSTLS to follow. RV shows impaired GLS only in severely ill patients highlighting RVGLS as a helpful tool of prognosis. Recovered patients from Covid-19 infection have to be monitored for a long time, since the duration and evolution of these lesions is unknown, and the term "long covid disease" might also include the cardiac function.