

One month follow-up of post-discharge COVID-19 patients shows persistent sonographic signs of cardiac remodeling and mildly impaired longitudinal function regardless of presence of hypertension

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Topic(s):

Heart Failure with Preserved Ejection Fraction (HFpEF)

Background. Impaired functional status is one of the typical long-term sequelae of COVID-19 infection. Minor impairment of cardiac function that is unable to cause manifestation of overt congestive heart failure may remain undetected in COVID-19 convalescents, in the same time contributing to persistence of symptoms and development of long COVID syndrome.

Purpose. To study the typical features and short-term dynamics of cardiac remodeling and possible signs of cardiac dysfunction in hypertensive and non-hypertensive patients with COVID-19 infection.

Methods. 149 hospitalized patients (72 male and 77 female, mean age 52.4±14.0 years) with COVID-19 infection (CoV) underwent comprehensive transthoracic echocardiography pre-discharge and after 30 days, with subsets of hypertensive (n=69) and non-hypertensive participants (n=80) being compared to age-, sex-, height- and weight-matched controls (n1=40, n2=31). 2016 EACVI/ASE guidelines on assessment of diastolic function were used to grade diastolic dysfunction (DD).

Results. Non-hypertensive, non-diabetic CoV patients have, nevertheless, displayed persistent concentric phenotype of left ventricular (LV) remodeling throughout the observation period (38 (47.5%) at baseline vs 44 (53.7%) at 1 month, p=0.343, with 4 (19.0%) in control group, p < 0.001 vs both visits), presented in increased relative and absolute wall thickness, as well as mildly increased LV myocardial mass index (LV hypertrophy detected in 3 (3.8%) patients). Functionally, signs of mild worsening of LV longitudinal function have been detected at both visits, presented as a relative decrease in LV global longitudinal strain (GLS), mitral e', and higher E/e' ratio.

CoV patients with hypertension persistently displayed similar but more pronounced phenotype of structural and functional alterations (concentric LV geometry in 54 (78.3%) cases at baseline vs 57 (82.6%) at 1 month, p=0.519, with 7 (17.5%) in control group, p < 0.001 vs both visits); LV hypertrophy was observed in 10 (14.5%) cases, p=0.021 vs non-hypertensives.

A significant incidence of LV DD was observed both in non-hypertensive (16 (20%) Grade I + 4 (5%) indeterminate DD at baseline vs 18 (22%) Grade I + 6 (7.3%) indeterminate DD at 1 month, p=0.479, with 0 cases in control group, p < 0.01 vs both visits), as well as hypertensive participants (21 (30.4%) Grade I + 7 (10.1%) indeterminate DD at baseline vs 25 (36.2%) Grade I + 8 (11.6%) indeterminate DD at 1 month, p=0.391, with 0 cases in control group, p < 0.001 vs both visits).

Conclusions. Recovering COVID-19 patients were characterized by frequent development of LV concentric geometry (ranging from 48% in non-hypertensive to 78% in hypertensive participants), predominantly Grade I diastolic dysfunction (25 to 40%, respectively), and mild decrease in LV global longitudinal strain, all of which persisted at 1 month after discharge with no tendency to improvement regardless of presence of hypertension.

