

Prospective case-control study of cardiovascular abnormalities six months following mild COVID-19 in healthcare workers

Joy G.¹; Artico J.¹; Kurdi H.¹; Lau C.²; Adam RD.¹; Menacho KM.¹; Pierce I.¹; Captur G.³; Davies R.⁴; Schelbert EB.⁵; Fontana M.³; Kellman P.⁶; Treibel TA.¹; Manisty C.¹; Moon JC.¹

¹Barts Heart Centre, London, United Kingdom of Great Britain & Northern Ireland

²Queen Mary University of London, London, United Kingdom of Great Britain & Northern Ireland

³Royal Free Hospital, London, United Kingdom of Great Britain & Northern Ireland

⁴University College of London, London, United Kingdom of Great Britain & Northern Ireland

⁵University of Pittsburgh, Pittsburgh, United States of America

⁶National Institutes of Health, Bethesda, United States of America

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Background: Recent CMR studies have reported cardiac abnormalities after COVID-19 are common, even after mild, non-hospitalised illness with evidence of ongoing myocardial inflammation. Such a prevalence of chronic myocarditis after mild disease has prompted societal concerns in diverse domains, and suggests that screening should be considered post COVID-19, even in asymptomatic individuals. Cardiovascular magnetic resonance (CMR) has proven utility for diagnosis in patients with COVID-19 infection and elevated troponin from unclear causes by measuring cardiac structure, function, myocardial scar (late gadolinium enhancement) and oedema (T1 and T2 mapping).

Objectives: We aimed to determine the prevalence and extent of late cardiac and cardiovascular sequelae after mild non-hospitalised SARS-CoV-2 infection.

Methods: Participants were recruited from COVIDsortium, a three-hospital prospective study of 731 healthcare workers who underwent first wave weekly symptom, PCR and serology assessment over 4 months, with seroconversion in 21.5% (n = 157). At 6 months post infection, 74 seropositive and 75 age-, sex-, ethnicity-matched seronegative controls were recruited for cardiovascular phenotyping (comprehensive phantom-calibrated Cardiovascular Magnetic Resonance and blood biomarkers). Analysis was blinded, using objective AI analytics where available.

Results: 149 subjects (mean age 37 years, range 18-63, 58% female) were recruited. Seropositive infections had been mild with case definition/non-case definition/asymptomatic disease in 45(61%), 18(24%) and 11(15%) with one person hospitalised (for 2 days). Between seropositive and seronegative groups, there were no differences in cardiac structure (left ventricular volumes, mass; atrial area), function (ejection fraction, global longitudinal shortening, aortic distensibility), tissue characterisation (T1, T2, ECV mapping, late gadolinium enhancement) or biomarkers (troponin, NT-proBNP). With abnormal defined by the 75 seronegatives (2 standard deviations from mean, e.g. EF < 54%, septal T1 > 1072ms, septal T2 > 52.4ms), individuals had abnormalities including reduced EF (n = 2, minimum 50%), T1 elevation (n = 6), T2 elevation (n = 9), LGE (n = 13, median 1%, max 5% of myocardium), biomarker elevation (borderline troponin elevation in 4; all NT-proBNP normal). These were distributed equally between seropositive and seronegative individuals.

Conclusions: Cardiovascular abnormalities are no more common in seropositive vs seronegative otherwise healthy, workforce representative individuals 6 months post mild SARS-CoV-2 infection. Our study provides societal reassurance for the cardiovascular health of working-aged individuals with convalescence from mild SARS-CoV-2. Screening asymptomatic individuals following mild diseases is not indicated.