

Abnormal echocardiographic findings after COVID-19 infection: a multicenter registry

S. Garcia-Zamora¹, J.M. Picco², A.J. Lepori³, M.I. Galello⁴, A.K. Saad⁵, M. Ayon⁶, N. Monga-Aguilar⁷, I. Shehadeh⁸, C.F. Manganiello⁹, C. Izaguirre¹⁰, L.N. Fallabrino¹¹, S. Ghibauda¹², M. Priotti¹, P.M. Merlo⁷, N. Gastaldello⁷

¹Delta Sanatorium, Rosario, Argentina; ²Wolff Institute of cardiology, Institute of Cardiology and Sports Medicine Wolff. Mendoza, Argentina, Mendoza, Argentina; ³Institute of Cardiology and Cardiovascular Surgery, Posadas, Misiones, Posadas, Argentina; ⁴Southern Scientific Foundation. Adrogué, Buenos Aires, Argentina; ⁵Hospital de Clinicas Jose de San Martin, Buenos Aires, Argentina; ⁶Sanatorio Junin, Catamarca, Argentina; ⁷Argentine Association of Critical Ultrasonography, ASARUC, Buenos Aires, Argentina; ⁸Clinica Cardiovision. Esteio, Rio Grande do Sul, Esteio, Brazil; ⁹Hospital de Bolívar Dr. Miguel Capredoni, Bolivar, Argentina; ¹⁰Adventist clinic of Belgrano, Buenos Aires, Argentina; ¹¹CID Centro de Diagnóstico, Buenos Aires, Argentina; ¹²Instituto Cardiovascular de Buenos Aires, Buenos Aires, Argentina

Funding Acknowledgement: Type of funding sources: None.

Background: The Coronavirus Disease 2019 (COVID-19) pandemic has transformed health systems worldwide. There is conflicting data regarding the degree of cardiovascular involvement following infection, generating uncertainty in patients and an additional healthcare burden with increased diagnostic testing. A registry was designed to evaluate the prevalence of echocardiographic abnormalities in Latin American adults recovered from COVID-19.

Methods: We prospectively evaluated 595 participants (mean age 45.5±14.9 years; 50.8% female) from 10 institutions in Argentina and Brazil. Echocardiographic studies were conducted with General Electric equipment; 2DE imaging and global longitudinal strain (GLS) of both ventricles were performed. Comparisons between groups were made with Chi-square, Fisher and Student’s t-test. Logistic regression was performed to determine variables associated with abnormal echocardiogram findings.

Results: A total of 61.7% of the participants denied any relevant cardiovascular medical history. Table 1 summarizes the comorbidities of the included patients. The majority of patients (82.5%) had the disease at home or in an out-of-hospital center. Of the patients who required hospitalization, 15.3% were in a general ward, 1.9% in intensive care and 0.3% required mechanical ventilation during the disease. The median time between infection and performance of the echocardiographic study was two months (IQR 1–3 months). Among patients who reported symptoms following COVID-19

recovery (41.8%), the most frequently reported was dyspnea (47.4%), followed by mild symptoms such as asthenia, arterial hypertension or palpitations (32.9%), 12.9% referred chest pain, 6% of patients reported dyspnea and chest pain, and 0.8% reported various other symptoms. The mean left ventricular ejection fraction (LVEF) was 61.0±5.5% and the mean left atrial volume was 33.1±13.2 ml/m². In patients without prior comorbidities, 8.2% had some echocardiographic abnormality (Figure 1). We found no significant differences in LVEF between symptomatic and asymptomatic patients (61.4% versus 60.6% respectively, p=0.104). Symptomatic patients showed slightly reduced GLS (–20.3% versus –20.9%, p=0.012) with a trend in the same direction in the RV free wall GLS (–25.6% versus –26.3%, p=0.103).

Male patients were more likely to have any new echocardiographic abnormalities (OR 2.82, p=0.002). Time elapsed since infection resolution (p=0.245), the presence of symptoms (p=0.927), or history of hospitalization during infection (p=0.671) did not have any correlation with echocardiographic abnormalities. The difference between sexes remains unchanged after adjusting for left atrial volume, wall thicknesses, diastolic function and abnormal wall motion.

Conclusion: Our results suggest that cardiovascular abnormalities after COVID-19 infection are rare and usually mild, especially in cases of mild disease. These abnormalities may be more frequent among males

Table 1. Characteristics of the study population, according to sex

Characteristics	Overall (n=595)	Female (n=302)	Male (n=293)	"p"
Body mass index (kg/m ²)	26.8 ±4.8	26.3 ±5.3	27.4 ±4.1	0.005
Arterial hypertension	28.6%	23.2%	34.1%	0.003
Diabetes	6.1%	3.3%	8.9%	0.005
Dyslipidemia	3.5%	2.0%	5.1%	0.046
Smokers	2.5%	3.3%	2.1%	0.180
Former smokers	1.9%	1.0%	2.7%	0.150
Cardiovascular diseases	3.0%	1.7%	4.8%	0.036
Valvular diseases	2.0%	2.0%	2.1%	0.593
Other cardiovascular diseases	3.5%	4.3%	2.7%	0.376
Non cardiovascular diseases	3.9%	4.3%	3.4%	0.573

