

Supplemental Online Content

COVID-19 vaccination-related myocarditis in Korea: A Comprehensive Nationwide Report

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Table S1. Electrocardiography (ECG) and Imaging Findings

Variable	Value
ECG Findings (n=322)	
Normal (%)	104 (32)
ST-segment elevation (%)	134 (42)
Diffuse	113 (35)
Non-diffuse	21 (7)
PR segment depression (%)	73 (23)
ST-segment depression in aVR (%)	76/322 (24)
Low-voltage QRS (%)	27/322 (8)
Corrected QT interval (msec)	419.7 (67.9)
Bundle branch block (%)	26 (8)
Atrioventricular block (%)	13 (4)
Premature ventricular beat (%)	22 (7)
T-wave inversion (%)	79 (25)
Atrial fibrillation (%)	9 (3)
Echocardiography findings (n=285)	
LVEF (%)	55.6 (15.3)
LVEF < 50% (%)	66 (23)
Cardiac MRI findings (n=78)	
LVEF (%)	53.3 (11.9)
LVEF < 50% (%)	26 (33)
LGE (%)	54 (69)

Data are mean (SD), n (%), or median (IQR). LVEF: left ventricular ejection fraction, MRI: magnetic resonance imaging, LGE: late gadolinium enhancement.

Table S2. Summary of FM cases after COVID-19 vaccination

Case	Age	Sex	Types of vaccine	Vaccination order	Vaccination to symptom (days)	*LVEF (%)	ECMO use	Discharge status
1	52	F	ChAdOx1	1	27	Unknown	Yes	Recovered discharge
2	82	M	ChAdOx1	1	2	20.0	No	Dead
3	85	M	BNT162b2	2	2	21.0	No	Dead
4	62	M	ChAdOx1	1	37	13.0	Yes	Dead
5	48	F	BNT162b2	2	1	13.0	Yes	Heart Transplantation
6	49	F	BNT162b2	1	6	Unknown	No	Recovered discharge
7	38	F	BNT162b2	1	4	5.0	Yes	Recovered discharge
8	44	M	BNT162b2	1	25	13.0	No	Recovered discharge
9	58	M	BNT162b2	1	2	38.0	Yes	Recovered discharge
10	65	M	ChAdOx1	2	8	10.0	Yes	Dead
11	95	F	BNT162b2	1	11	21.0	No	Dead
12	51	F	BNT162b2	1	6	20.0	Yes	Recovered discharge
13	67	M	ChAdOx1	2	15	19.0	Yes	Recovered discharge
14	50	F	mRNA-1273	1	6	46.0	No	Recovered discharge
15	60	M	ChAdOx1	2	17	39.0	Yes	Recovered discharge
16	66	F	ChAdOx1	2	35	32.6	Yes	Dead
17	34	M	BNT162b2	1	0	5.0	Yes	Dead
18	63	F	ChAdOx1	2	3	10.0	Yes	Dead
19	36	F	BNT162b2	2	18	20.0	No	Recovered discharge
20	45	F	mRNA-1273	2	0	45.2	No	Recovered discharge
21	29	M	BNT162b2	1	17	20.0	Yes	Recovered discharge

22	26	M	BNT162b2	2	3	10.0	Yes	Recovered discharge
23	42	F	BNT162b2	2	39	45.0	No	Recovered discharge
24	22	F	BNT162b2	1	12	Unknown	No	Recovered discharge
25	36	F	mRNA-1273	1	9	25.1	Yes	Dead
26	44	F	mRNA-1273	2	38	35.0	Yes	Recovered discharge
27	38	F	mRNA-1273	2	30	44.0	No	Recovered discharge
28	46	M	BNT162b2	2	14	30.0	Yes	Recovered discharge
29	24	F	BNT162b2	2	4	20.0	Yes	Dead
30	16	F	BNT162b2	1	0	Unknown	No	Recovered discharge
31	30	F	mRNA-1273	2	8	Unknown	No	Recovered discharge
32	23	F	mRNA-1273	2	2	5.0	Yes	Dead
33	13	F	BNT162b2	1	0	36.0	Yes	Recovered discharge
34	76	F	BNT162b2	3	0	Unknown	No	Dead
35	13	M	BNT162b2	2	2	Unknown	No	Recovered discharge
36	67	M	mRNA-1273	3	14	22.0	Yes	Dead

FM: fulminant myocarditis, COVID-19: coronavirus disease 2019, LVEF: left ventricular ejection fraction. *means minimal LVEF during hospitalization.

Table S3. Independent predictors of severe VRM in patients with COVID-19 vaccination

Variables	Univariate analysis		Multivariate analysis	
	Odd ratio (95% confidence interval)	<i>p</i> -value	Odd ratio (95% confidence interval)	<i>p</i> -value
Age >40 years	2.04 (1.29-3.23)	0.002	2.23 (1.11-4.46)	0.024
Female sex	1.74 (1.11-2.74)	0.017	1.14 (0.61-2.15)	0.680
Dyspnea	2.19 (1.36-3.51)	0.001	1.28 (0.69-2.39)	0.439
Fever	2.47 (1.44-4.23)	0.001	1.86 (0.95-3.65)	0.071
SBP <100 mmHg	9.07 (4.60-17.91)	<0.001	8.23 (4.01-16.88)	<0.001
History of hypertension	2.55 (1.13-5.76)	0.025	0.55 (0.17-1.82)	0.330

VRM: vaccine-related myocarditis, SBP: systolic blood pressure

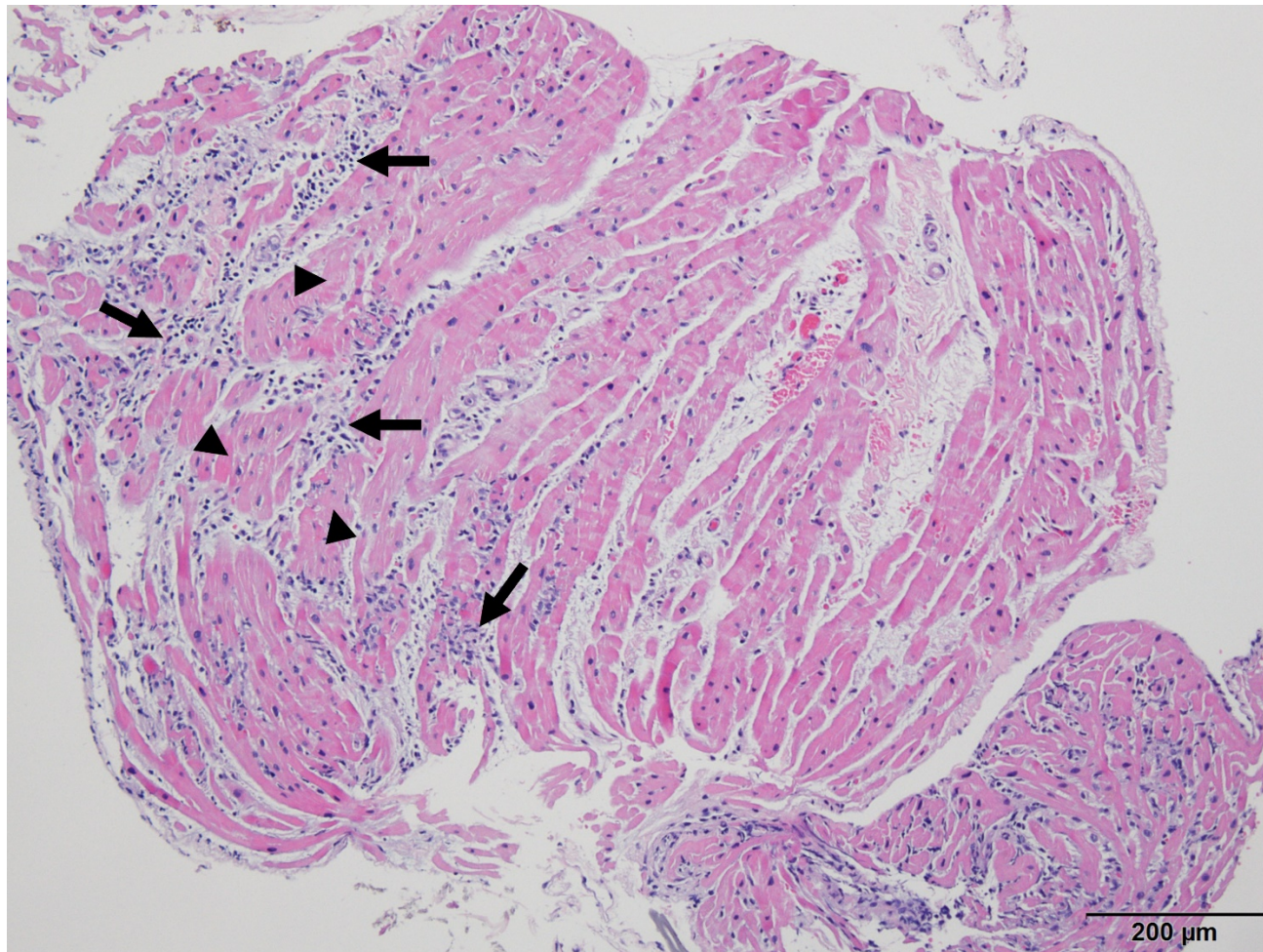


Figure S1. Histopathologic findings of endomyocardial biopsy of a previously healthy 44-year-old female with VRM after receiving mRNA-1273 vaccine revealed marked infiltration of lymphohistocytes (arrow) within the myocardium (arrowhead) ($\times 40$, Hematoxylin-eosin stain).