

Supplementary Figure 1.

CARDIOVASCULAR DISEASE AND COVID-19 VACCINES



As of June 2022, 11.5+ billion COVID-19 vaccines have been given

Common side effects include fever, fatigue, and pain and swelling at site of injection

RARE, BUT SERIOUS

CARDIOVASCULAR SIDE EFFECTS



HAVE BEEN REPORTED IN LITERATURE



We systematically searched for case reports and case series reporting cardiovascular complications after COVID-19 vaccination

OUR RESULTS

41 case series and 109 case reports were identified

A prevalence of complications among males (86.6%) was noted

Myocarditis (76%), myopericarditis (14%), arrhythmia (8%), and ischemic heart disease (3%) were the most common complications

The mRNA vaccines were the most likely culprit causing myocarditis



Take home message

The overall risk of serious cardiac side effects is low.

These reports should not cause vaccine hesitancy.

Clinicians should be aware of the possibility of such adverse events.

Supplementary Table 1. Characteristics, clinical manifestations, treatments, and prognosis of the patients

Study ID	Study Design	Case	Country	Age	Gender	Type of vaccine	Dose	Comorbidities	Time from vaccination to the onset of the symptoms (Hours)	Final diagnosis and clinical presentation	Treatment	Improvement
Abbate 2021[1]	Case series	Case 1	USA	27	Male	Pfizer-BioNTech.	Second	NR	36	Myopericarditis presented with chest pain and dyspnea	IVIG, IV steroids	NO
		Case 2		34	Female	Pfizer-BioNTech.	First	NR	216	Myopericarditis presented with chest pain and cough and dyspnea	IVIG, IV steroids	Yes
Abu Mouch 2021[2]	Case series	Case 1	Isreal	24	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain	NSAIDs, colchicine	Yes
		Case 2		20	Male	Pfizer-BioNTech.	Second	NR	24	Myocarditis presented with chest pain	NSAIDs, colchicine	Yes
		Case 3		29	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain	NSAIDs, colchicine	Yes
		Case 4		45	Male	Pfizer-BioNTech.	First	NR	384	Myocarditis presented with chest pain	NSAIDs, colchicine	Yes
		Case 5		16	Male	Pfizer-BioNTech.	Second	NR	24	Myocarditis presented with cough, fever, and chest pain	NSAIDs, colchicine	Yes
		Case 6		17	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain	NSAIDs, colchicine	Yes
Agdamg 2022[3]	Case report	Case 1	USA	80	Female	Pfizer-BioNTech.	First	NR	168	Myocarditis presented with cough	IV steroids, Dobutamine	Yes
Ahmad 2022[4]	Case series	Case 1	Iraq	28	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain and fatigue.	Colchicine, NSAIDs	Yes
		Case 2		34	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain, fever, and SOB.	NSAIDs	Yes
		Case 3		19	Male	Moderna.	Second	NR	48	Myocarditis presented with chest pain and fatigue.	NSAIDs	Yes
		Case 4		16	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis presented with chest pain, chills, and fatigue.	NSAIDs	Yes
		Case 5		22	Male	Pfizer-BioNTech.	Second	NR	24	Myocarditis presented with chest pain, fatigue, fever, and headache.	Colchicine, NSAIDs	Yes
		Case 6		17	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain, fever, and fatigue.	NSAIDs	Yes
		Case 7		36	Male	Moderna.	Second	NR	24	Myocarditis presented with chest pain, SOB, and myalgia.	Colchicine, NSAIDs	Yes
Alania-Torres 2021[5]	Case report	1	Spain	28	Male	Pfizer-BioNTech.	Second	CVS	336	Myocarditis and myopathy presented with progressive muscle weakness involving the scapular and pelvic girdles, chest pain, fatigue, and dyspnea.	Acetaminophen, metamizole, colchicine, intravenous opioids, and aspirin.	Yes
Albert 2021[6]	Case report	1	USA	24	Male	Moderna.	Second	NR	96	Myocarditis presenting with substernal chest pain.	Non-steroidal anti-inflammatory drugs and beta blockers.	Yes
Alizadeh 2022[7]	Case report	1	Germany	29	Male	AstraZeneca.	NR	NR	72	Myocarditis presented with fever and retrosternal pain.	Antiphlogistics, ace-inhibitors, and beta-blockers.	Yes
Ambati 2021[8]	Case series	Case 1	USA	16	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with cough and fever	NSAIDs	Yes
		Case 2		17	Male	Pfizer-BioNTech.	Second	Lung disease	72	Myocarditis	Ibuprofen, troponins, narcotics	Yes
Amir 2022[9]	Case series	Case 1	Israel	17	Male	Pfizer-BioNTech.	Second	NR	17	Myocarditis presented with chest pain	Aspirin, colchicine, cardiloc	Yes

		Case 2		16	Male	Pfizer-BioNTech.	Second	NR	16	Myocarditis	NSAID	Yes
		Case 3		16	Male	Pfizer-BioNTech.	Second	NR	16	Myocarditis	NSAID	Yes
		Case 4		16	Male	Pfizer-BioNTech.	Second	NR	16	Myocarditis presented with chest pain	NSAID	Yes
		Case 5		17	Male	Pfizer-BioNTech.	Second	NR	17	Myocarditis	NSAID	Yes
		Case 6		16	Male	Pfizer-BioNTech.	First	NR	16	Myocarditis	NR	Yes
		Case 7		17	Male	Pfizer-BioNTech.	Second	NR	17	Myocarditis	NSAID	Yes
		Case 8		17	Male	Pfizer-BioNTech.	Second	NR	17	Myocarditis presented with chest pain	NSAID	Yes
		Case 9		17	Male	Pfizer-BioNTech.	Second	NR	17	Myocarditis presented with chest pain	Colchicine, tritace,	Yes
		Case 10		17	Male	Pfizer-BioNTech.	Second	NR	17	Myocarditis presented with chest pain	aspirin	Yes
		Case 11		19	Male	Pfizer-BioNTech.	Second	NR	19	Myocarditis	NR	Yes
		Case 12		14	Male	Pfizer-BioNTech.	Second	NR	14	Myocarditis presented with chest pain	NSAID, colchicine, steroids	Yes
		Case 13		17	Male	Pfizer-BioNTech.	Second	NR	17	Myocarditis	steroids, IVIG, NSAID	Yes
		Case 14		17	Male	Pfizer-BioNTech.	Second	NR	17	Myocarditis	NSAID	Yes
		Anthony 2022[10]		Case report	1	USA	45	Male	Moderna.	Second	NR	72
Ashaar 2021[11]	Case report	1	Ireland	66	Male	Pfizer-BioNTech.	First	CVD, DM	168	Pericarditis presented with sharp, positional chest pain (worse on lying flat), shortness of breath, cough, and hypotension.	Non-steroidal anti-inflammatory drugs and paracetamol.	Yes
Azdaki 2021[12]	Case report	1	Iran	70	Male	AstraZeneca.	First	Hypertension, DM	72	Myocarditis presented with syncopal attacks.	Magnesium sulfate.	Yes
Azir 2021[13]	Case report	1	USA	17	Male	Pfizer-BioNTech.	Second	NR	24	Focal myocarditis presented with substernal chest pain and exertional dyspnea.	NR	Yes
Bartlett 2021[14]	Case report	1	USA	46	Male	Pfizer-BioNTech.	Second	NR	24	Myopericarditis presented with pleuritic non-exertional chest pain, fever, and tachycardia.	Naproxen, aspirin, ketorolac, colchicine, metoprolol, and ibuprofen.	Yes
Bews 2022[15]	Case series	Canada	Case 1	21	Female	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with sharp central chest pain, and radiation to the back.	Ibuprofen.	Yes
			Case 2	45	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis presented with shortness of breath with intermittent burning central chest pain.	Colchicine, metoprolol, aspirin.	Yes
			Case 3	31	Male	Moderna.	Second	NR	480	Myocarditis presented with central chest heaviness, and radiation to bilateral shoulders.	Ibuprofen and colchicine.	Yes
			Case 4	21	Male	Moderna.	Second	NR	72	Myocarditis presented with central chest pressure, worse with activity.	Ibuprofen and colchicine.	Yes
			Case 5	31	Male	Moderna.	Second	NR	96	Myocarditis presented with central chest heaviness, radiation to bilateral arms, associated palpitations, emesis, and mild shortness of breath.	Ibuprofen and colchicine.	Yes

		Case 6		30	Male	Moderna.	Second	NR	72	Myocarditis presented with aching chest pain, radiation to the back and shoulders, associated diaphoresis, weakness, nausea and diarrhea.	Colchicine.	Yes
		Case 7		22	Male	Moderna.	Second	NR	72	Myocarditis presented with fever, chills and diffuse myalgias since vaccination, and burning, central chest pain peaking on the day of presentation.	None.	Yes
		Case 8		23	Male	Moderna.	Second	NR	48	Myocarditis presented with sharp, pleuritic chest pain, associated rhinitis, pharyngitis, headache, nausea, and body aches.	Ibuprofen and colchicine.	Yes
		Case 9		18	Male	Moderna.	Second	NR	48	Myocarditis presented with central chest tightness, radiation to the back, and worse with inspiration.	Ibuprofen and colchicine.	Yes
		Case 10		18	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain, worse when supine.	Ibuprofen.	Yes
Boivin 2021[16]	Case report	1	USA	96	Female	Moderna.	First	Hypertension	1	Anterior myocardial infarction presented with chest discomfort.	Heparin drip and the patient declined cardiac catheterization.	NO
Brage 2022[17]	Case report	1	Spain	62	Female	Moderna.	Third	NR	24	Myocarditis presented with fever, asthenia, hypotension, and tachycardia. (Fulminant myocarditis with severe left ventricular dysfunction in cardiogenic shock)	Vasoactive and inotropic support with dobutamine and noradrenaline at high doses and non-invasive mechanical ventilation was started with BiPAP. Glucocorticoids and immunoglobulins also were administrated.	Yes
Calderón-Colmenero 2021[18]	Case report	1	Mexico	39	Male	Pfizer-BioNTech.	Second	Immune disease, lung disease	6	Myocarditis	Anti-inflammatory drugs	Yes
Cereda 2021[19]	Case report	1	Italy	21	Male	Pfizer-BioNTech.	Second	NR	30	Myocarditis presented with chest pain and cough	Bisoprolol, Ramipril	Yes
Chachar 2021[20]	Case report	1	Bahrain	24	Male	Pfizer-BioNTech.	First	NR	120	Myocarditis presented with chest pain and cough and fever.	Perindopril and bisoprolol.	Yes
Chamling 2021[21]	Case series	Case 1	Germany	68	Female	AstraZeneca.	First	CVD	24	Infarct-like myocarditis presented with chest pain radiating to the left shoulder.	Nitroglycerin.	Yes
		Case 2		25	Male	Pfizer-BioNTech.	First	NR	240	Infarct-like myocarditis presented with chest discomfort.	Aspirin, anticoagulant	Yes
		Case 3		20	Male	Pfizer-BioNTech.	Second	NR	72	Infarct-like myocarditis presented with very severe chest pain.	NR	Yes
Chatterjee 2021[22]	Case report	1	India	63	Male	AstraZeneca.	First	NR	48	Myocardial infarction presented with chest pain, uneasiness, dizziness, and excessive sweating.	center	Yes
Chelala 2021[23]	Case series	Case 1	USA	16	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis	NR	Yes

		Case 2		17	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis presented with chest pain	Aspirin	Yes
		Case 3		17	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis	NSAID	Yes
		Case 4		19	Male	Moderna.	Second	NR	72	Myocarditis presented with chest pain	Colchicine, metoprolol	Yes
		Case 5		17	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis	Metoprolol	Yes
Chellapandian 2022[24]	Case report	1	Qatar	22	Male	Moderna.	Second	NR	48	Myocarditis presented with chest pain and generalized body pain.	Colchicine and ibuprofen.	Yes
Choi 2021[25]	Case report	1	Korea	22	Male	Pfizer-BioNTech.	First	NR	120	Myocarditis presented with cough and fever	NR	NO
Chow 2022[26]	Case report	1	Canada	45	Female	Moderna.	First.	NR	168	Myocarditis presented with palpitations, fatigue, exertional dyspnea, and syncope.	Prednisone, amiodarone, ramipril, metoprolol, aspirin, ticagrelor, and fondaparinux.	Yes
Crane 2021[27]	Case report	1	Australia	72	Male	AstraZeneca.	First.	CVS, immune disease, hypertension, DM	96	Myocarditis presented with retrosternal chest pain with associated dyspnea, tachypnea, and tachycardia.	NR	Yes
D'Angelo 2021[28]	Case report	1	Italy	30	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis Presented with cough and chest pain	Bisoprolol, acetylsalicylic acid, prednisolone	Yes
Das 2021[29]	Case series	Case 1	USA	15	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain	Ibuprofen	Yes
		Case 2		15	Female	Pfizer-BioNTech.	Second	NR	48	Myocarditis	Ibuprofen	Yes
		Case 3		15	Male	Pfizer-BioNTech.	Second	NR	3	Myocarditis presented with chest pain	Ibuprofen	Yes
		Case 4		17	Male	Pfizer-BioNTech.	First	NR	480	Myocarditis presented with chest pain	Ibuprofen	Yes
		Case 5		17	Male	Pfizer-BioNTech.	Second	NR	24	Myocarditis	Ibuprofen, IVIG	Yes
		Case 6		17	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis Presented with cough and dyspnea	Ibuprofen	Yes
		Case 7		16	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis	Ibuprofen	Yes
		Case 8		15	Male	Pfizer-BioNTech.	First	NR	72	Myocarditis	NR	Yes
		Case 9		16	Male	Pfizer-BioNTech.	Second	NR	24	Myocarditis presented with chest pain	Ibuprofen	Yes
		Case 10		12	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis presented with chest pain	Ibuprofen	Yes
		Case 11		15	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis	Ibuprofen	Yes
		Case 12		15	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain and fever	Ibuprofen	Yes
		Case 13		17	Male	Pfizer-BioNTech.	Second	NR	24	Myocarditis presented with dyspnea and cough	Ibuprofen	Yes
		Case 14		17	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain	Ibuprofen	Yes
		Case 15		14	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain	Ibuprofen	Yes
		Case 16		14	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis	Ibuprofen	Yes
		Case 17		12	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis	Ibuprofen	Yes
		Case 18		17	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis presented with chest pain	Ibuprofen	Yes
		Case 19		16	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis	Naproxen, enalapril, spironolactone	Yes
		Case 20		16	Female	Pfizer-BioNTech.	First	NR	120	Myocarditis	Lasix, ibuprofen	Yes
		Case 21		13	Female	Pfizer-BioNTech.	Second	NR	48	Myocarditis	Ibuprofen	Yes

										presented with chest pain		
		Case 22		16	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis	Enalapril, spironolactone	Yes
		Case 23		15	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis	Ibuprofen	Yes
		Case 24		15	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain	Ketorolac, IVIG, methylprednisolone, low-dose aspirin	Yes
		Case 25		16	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis	Ibuprofen	Yes
Deb 2021[30]	Case report	1	USA	67	Male	Moderna.	Second	CVS, lung disease, hypertension, DM	6	Myocarditis Presented with dyspnea	Diuretics, oxygen, furosemide, bronchodilators, hydralazine, ceftriaxone, azithromycin	Yes
Dickey 2021[31]	Case series	Case 1	USA	37	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis	NR	Yes
		Case 2		18	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis Presented with dyspnea	NR	Yes
		Case 3		23	Male	Moderna.	Second	NR	96	Myocarditis	NR	Yes
		Case 4		23	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis	NR	Yes
		Case 5		18	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis presented with chest pain	NR	Yes
		Case 6		18	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis	NR	Yes
Dionne 2021[32]	Case series	Case 1	USA	15	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain and a cough	NR	Yes
		Case 2		15	Male	Pfizer-BioNTech.	First	NR	96	Myocarditis	NR	Yes
		Case 3		15	Male	Pfizer-BioNTech.	Second	NR	24	Myocarditis	NR	Yes
		Case 4		15	Female	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain	NR	Yes
		Case 5		15	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis	IVIG, steroids	Yes
		Case 6		15	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis	NR	Yes
		Case 7		15	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain	NR	Yes
		Case 8		15	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis	IVIG, steroids	Yes
		Case 9		15	Male	Pfizer-BioNTech.	Second	NR	24	Myocarditis	IVIG, steroids	Yes
		Case 10		15	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis	IVIG, steroids	Yes
		Case 11		15	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis presented with chest pain	IVIG, steroids	Yes
		Case 12		15	Male	Pfizer-BioNTech.	Second	NR	144	Myocarditis	NR	Yes
		Case 13		15	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis Presented with cough and fever	NR	Yes
		Case 14		15	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain	IVIG, steroids	Yes
		Case 15		15	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis Presented with chest pain and cough	IVIG, steroids	Yes
Dlewati 2022[33]	Case report	1	USA	48	Male	Moderna.	Second	NR	72	Myocarditis Presented with dyspnea and cough	Metoprolol succinate, atorvastatin	Yes
Ehrlich 2021[34]	Case report	1	Germany	40	Male	Pfizer-BioNTech.	First	NR	144	Myocarditis presented with chest pain and dyspnea and cough	acetylsalicylic acid, unfractionated heparin, ACE inhibitor, beta-blocker, mineralocorticoid antagonist	Yes
Elhouderi 2022[35]	Case report	1	USA	30	Male	Pfizer-BioNTech.	Second	NR	168	Myopericarditis presented with midsternal chest pain, fever, chills, and shortness of breath	Steroid and nonsteroidal anti-inflammatory medications.	Yes
Etuk 2022[36]	Case report	1	USA	18	Male	Moderna.	First.	NR	8	Myocarditis presented with sudden onset of chest pain radiating to the back and worse	Steroids and Tylenol.	Yes

										with inhalation and coughing and is associated with fever, cough, shortness of breath, fatigue, diarrhea, and vomiting.		
Fadah 2022[37]	Case report	1	USA	18	Male	Moderna.	First	NR	72	Myopericarditis presented with chest pain and dyspnea and cough and fever.	Nitroglycerin for pain at presentation. Given lisinopril, colchicine, and ibuprofen during a hospital stay. Discharged on ibuprofen and colchicine.	Yes
Farooq 2022[38]	Case report	1	UK	63	Male	AstraZeneca.	Second	Lung disease	NR	Myopericarditis, myositis, and pneumonitis presented with shortness of breath	IV methylprednisolone for three days followed by oral prednisolone 40 mg daily with weekly tapering, proton pump inhibitor, and vitamin D.	Yes
Fearon 2021[39]	Case report	1	USA	73	Female	Moderna.	First	Immune disease, Lung disease, Hypertension, CKD	24	Myocardial infarction with non-obstructive coronary arteries (MINOCA) presented with non-radiating, pressure-like dull chest pain with activity and at rest, shortness of breath, progressive dyspnea on exertion, orthopnea, nausea, vomiting, and fatigue.	Heparin, furosemide, metoprolol succinate, losartan.	Yes
Fleming-Nouri 2021[40]	Case series	Case 1	US	18	Male	Pfizer-BioNTech.	Second	NR	24	Myopericarditis presented with chest pain and cough and fever.	Four patients received steroids, four received IV immunoglobulin, three received aspirin, and five received NSAID	Yes
		Case 2		21	Male	Pfizer-BioNTech.	Second	NR	24	Myopericarditis presented with chest pain and fever.		Yes
		Case 3		17	Male	Pfizer-BioNTech.	Second	NR	168	Myopericarditis presented with chest pain.		Yes
		Case 4		23	Male	Pfizer-BioNTech.	Second	NR	24	Myopericarditis presented with chest pain and cough.		Yes
		Case 5		24	Male	Pfizer-BioNTech.	Second	NR	72	Myopericarditis presented with chest pain.		Yes
		Case 6		19	Male	Pfizer-BioNTech.	Second	NR	24	Myopericarditis presented with chest pain and dyspnea.		Yes
		Case 7		23	Male	Pfizer-BioNTech.	Second	NR	48	Myopericarditis presented with chest pain and cough.		Yes
		Case 8		16	Male	Pfizer-BioNTech.	Second	NR	48	Myopericarditis presented with chest pain and dyspnea.		Yes
Fosch 2022[41]	Case report	1	Spain	24	Male	Pfizer-BioNTech.	Third	Immune disease	24	Myocarditis Presented with dyspnea	ibuprofen, colchicine	Yes
Freise 2022[42]	Case series	Case 1	Germany	13	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain.	NR (Azithromycin with intermediate care)	Yes
		Case 2		28	Male	Pfizer-BioNTech.	Second	NR	48	Pericarditis presented with dyspnea, left-sided chest pain, and angina with minimal exertion.	NR (intermediate care)	Yes
		Case 3		28	Male	Moderna.	First	DM	48	STEMI presented with acute chest pain.	NR (intermediate care)	Yes

		Case 4		56	Female	Moderna.	Second	CVD	48	Myocarditis presented with shortness of breath, and sinus tachycardia.	NR (intermediate care)	Yes
		Case 5		42	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with shortness of breath and sinus tachycardia.	NR (intermediate care)	Yes
		Case 6		42	Male	Moderna.	Second	NR	240	Myocarditis presented with acute chest pain.	NR (intermediate care)	Yes
		Case 7		29	Female	Pfizer-BioNTech.	First	NR	24	Myocarditis presented with intermittent chest pain.	NR (intermediate care)	Yes
		Case 8		15	Female	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain.	NR (Hospitalization)	Yes
Fritz 2022[43]	Case report	1	USA	20	Male	Pfizer-BioNTech.	Third.	NR	72	Myopericarditis presented with aching, non-exertional, positional, and pleuritic substernal chest pain, myalgia, and fever.	Aspirin, colchicine, metoprolol, and indomethacin.	Yes
Generette 2022[44]	Case report	1	USA	74	Male	Pfizer-BioNTech.	Second	Hypertension	336	Myocarditis presented with fever, intermittent chills, and chest, back pain, bloody pericardial effusion, and dyspnea.	Pericardiocentesis, ibuprofen and colchicine.	Yes
Gill 2022 A[45]	Case report	1	USA	44	Male	Moderna.	Second	NR	96	Myocarditis presented with left-sided chest pain radiating to the left arm associated with shortness of breath.	Aspirin.	Yes
Gill 2022 B[46]	Case series	Case 1	USA	NR	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with sudden death.	None.	No
		Case 2		NR	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis presented with sudden death.	None.	No
Gomes 2022[47]	Case report	1	Portugal	32	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with presyncope and oppressive retrosternal chest pain, generalized myalgia, and fever.	NR	Yes
Hajsadeghi 2022[48]	Case report	1	Iran	72	Male	BIVI-CovIran vaccine	Third.	CVS, hypetension, DM	192	Pericarditis presented with exertional dyspnea, ascites, lower limb edema, and heart failure.	Hydrocortisone and, CABG and pericardiectomy	Yes
Hasnie 2021[49]	Case report	1	USA	22	Male	Moderna.	First	NR	216	Myopericarditis presented with sharp substernal non-radiating chest pain, at times pleuritic.	Aspirin, colchicine, and low-dose metoprolol.	Yes
Hassanzadeh 2022[50]	Case report	1	Iran	32	Female	AstraZeneca.	First.	NR	72	Myocarditis presented with dyspnea at rest, exertional dyspnea, and inappropriate exertional tachycardia.	Carvedilol, rivaroxaban, captopril and bisoprolol.	Yes
Hirsch 2022[51]	Case report	1	Germany	32	Male	Pfizer-BioNTech.	First.	NR	NR	Myocarditis presented with reduced exercise capacity and shortness of breath.	High-dose prednisolone 1000 mg/day for three consecutive days, followed by 1 mg/kg body weight/day + azathioprine 150 mg/day.	Yes
Horiuchi 2022[52]	Case report	1	Japan	32	Male	Moderna.	First.	NR	120	Myocarditis presented with fever, upper abdominal pain, tachypnoea, tachycardia, cardiogenic	High-dose steroid therapy and mechanical cardiac support.	Yes

										shock, and respiratory failure.		
Hung 2022[53]	Case report	1	Taiwan	23	Male	AstraZeneca.	First.	NR	168	Myopericarditis with pleuritis presented with fever, sore throat, progressive myalgia, tachypnea, tachycardia, and dyspnea	Bisoprolol, valsartan, steroid, colchicine, and aspirin.	Yes
Iqbal 2022[54]	Case report	1	Pakistan	61	Male	Moderna.	First	CVD, Hypertension, DM	1.5	Acute coronary syndrome (NSTEMI) presents with left arm and jaw pain, and dyspnea	Aspirin, clopidogrel, and intravenous anticoagulation given. Percutaneous coronary intervention to the right posterior descending artery was done.	Yes
Isaak 2021[55]	Case report	1	Germany	15	Male	Pfizer-BioNTech.	Second	NR	24	Myocarditis presented with chest pain and dyspnea	NR	Yes
Iwamuro 2022[56]	Case report	1	Japan	17	Male	Moderna.	Second	NR	72	Myocarditis presented with sharp substernal severe chest pain and fever and dyspnea	Acetaminophen.	Yes
Javed 2022[57]	Case report	1	USA	64	Male	Moderna.	Second	CVD, Immune Disease, Hypertension	168	Hemorrhagic Pleuropericarditis presented with retrosternal chest pain associated with shortness of breath	Colchicine, pain medications, and drainage of the pleural effusion	Yes
Kadwalwala 2021[58]	Case report	1	USA	38	Male	Moderna.	First	NR	192	Myocarditis Presented with chest pain and dyspnea	Steroids, solumedrol	Yes
Kaneta 2022[59]	Case report	1	Japan	25	Male	Moderna.	Second	NR	72	Myocarditis presented with chest pain and fever and dyspnea	NR.	Yes
Kang 2022[60]	Case report	1	Korea	48	Female	Pfizer-BioNTech.	Second	NR	96	Myocarditis (fulminant) presented with dull chest pain, tachycardia, and dyspnea	Heart transplantation.	Yes
Kawakami 2022[61]	Case report	1	Japan	45	Female	Moderna.	Second	NR	336	Myocarditis presented with chest pain and dyspnea	None.	Yes
Khan 2022[62]	Case report	1	USA	22	Male	Moderna.	Second	DM	720	Cardiomyopathy presented with left lower quadrant abdominal pain, tachycardia, left kidney infarction complicated by decompensated heart failure, and persistent cardiogenic shock.	Inotropic support, milrinone, and durable mechanical support device (Permanent Left Ventricular Assist Device).	NO
Kiblböeck 2022[63]	Case series	Case 1	Austria	18	Male	Pfizer-BioNTech.	First.	NR	72	Myopericarditis presented with chest discomfort and exertional pain.	NSAIDs failed for 5 days, then prednisolone was prescribed and ibuprofen for 14 days.	Yes
		Case 2		22	Male	Pfizer-BioNTech.	Second	NR	24	Myocarditis presented with chest pain unrelated to effort, dull, substernal, and persisted all day.	Symptomatic therapy for the pain.	Yes
		Case 3		38	Male	Pfizer-BioNTech.	Second	NR	96	Lymphocytic myocarditis presenting with syncope due to intermittent complete heart block	A temporary pacemaker that was removed before discharge	Yes
Kim 2021 A[64]	Case report	1	Korea	29	Male	Pfizer-BioNTech.	Second	NR	24	Myocarditis presented with chill and peripheral coldness then	Peripheral VA-ECMO and intra-aortic balloon pump (IABP), mechanical	Yes

										cardiogenic shock and refractory ventricular fibrillation, and complete atrioventricular block.	ventilation, milrinone and inhalation of nitric oxide, and corticosteroid.	
Kim 2021 B [65]	Case report	1	Korea	24	Male	Pfizer-BioNTech.	Second	NR	24	Myocarditis presented with chest pain and dyspnea	NSAID	Yes
Kimball 2022[66]	Case report	1	USA	57	Male	Pfizer-BioNTech.	Third	Hypertension	24	Myocarditis presented with chest pain and dyspnea	NSAID	Yes
Kimura 2022[67]	Case report	1	Japan	69	Male	Pfizer-BioNTech.	First.	CVS, hypertension,	168	Myocarditis presented with chest pain and dyspnea.	IVIg, colchicine and aspirin	Yes
Koizumi 2021[68]	Case series	Case 1	Japan	22	Male	Moderna.	Second	NR	48	Ventricular fibrillation triggered by fever from the vaccine, due to patient's Brugada Syndrome	Isoproterenol and quinidine, and an antipyretic	Yes
		Case 2		27	female	Moderna	second	NR	72	Myocarditis presented with non-radiating midsternal chest pain and pressure, palpitations, tachycardia, shortness of breath, myalgias, and chills.	Colchicine, non-steroidal anti-inflammatory drugs (NSAIDs), and beta-blockers.	Yes
Kojima 2022[69]	Case report	1	Japan	17	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis Presented with fever and dyspnea	NSAID, prednisone	Yes
Kokawa 2022[70]	Case report	1	Japan	41	Male	Pfizer-BioNTech.	Second	CVS	30	Myocarditis Presented with cough and dyspnea	NR	Yes
Kyaw 2022[71]	Case report	1	USA	24	Male	Pfizer-BioNTech.	Second	NR	6	Myocarditis Presented with chest pain and dyspnea and cough	Prednisone, colchicine	Yes
Larson 2021[72]	Case series	Case 1	USA	22	Male	Moderna.	Second	NR	72	Myocarditis	NR	Yes
		Case 2		31	Male	Moderna.	Second	NR	72	Myocarditis presented with chest pain and dyspnea	Colchicine	Yes
		Case 3		40	Male	Pfizer-BioNTech.	First	NR	48	Myocarditis	NSAID	Yes
		Case 4		56	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain and cough and dyspnea	NSAID	Yes
		Case 5		26	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis	NR	Yes
		Case 6		35	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis	LMWH	Yes
		Case 7		21	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis presented with chest pain and dyspnea and cough	LMWH	Yes
		Case 8		22	Male	Moderna.	Second	NR	48	Myocarditis presented with chest pain and dyspnea	LMWH	Yes
Łażniak-Pfajfer 2021[73]	Case series	Case 1	Poland	17	Male	Pfizer-BioNTech.	First	NR	192	Myocardial infarction presented with chest pain, diaphoresis, and vomiting.	PCI	Yes
		Case 2		17	Male	Pfizer-BioNTech.	First	NR	240	Stress-induced cardiomyopathy presented with transient chest discomfort and palpitations.	The patient was treated conservatively.	Yes
		Case 3		17	Male	Pfizer-BioNTech.	Second	NR	24	Myocardial infarction with nonobstructive coronary arteries presented with palpitations and shortness of breath.	NR	Yes

Lee 2021 [74]	Case series	Case 1	Singapore	70	Female	Pfizer-BioNTech.	First	CVS, hypertension, DM	6	Complete AV Block presented with bradycardic, palpitations, dyspnea, orthopnea, body aches, malaise, and fatigue.	Atropine, permanent pacemaker, low-dose dopamine, dexamethasone, remdesivir.	NO
		Case 2		44	Female	Pfizer-BioNTech.	First	CVS	0.25	Myocarditis	NSAID	Yes
		Case 3		73	Female	Pfizer-BioNTech.	First	NR	2	Myocarditis presented with fatigue, headache, abdominal pain, and chest pain radiating to the right arm and perspiration.	β -blocker, ACE inhibitor.	Yes
Lee 2022[75]	Case report	1	USA	84	Male	Pfizer-BioNTech.	Second	CVS, hypertension	1440	Myocarditis presented with abdominal pain and fatigue, chest pain.	β -blocker, ACE inhibitor.	Yes
Lee 2022[76]	Case report	1	South Korea	22	Male	Moderna.	Second	NR	120	Myocarditis presented with fatigue, throat pain, and dizziness.	β -blocker, ACE inhibitor.	Yes
Levin 2021[77]	Case series	Case 1	Israel	20	Male	Pfizer-BioNTech.	Second	NR	24	Myocarditis presented with chest pain radiating to the left arm, and fatigue.	Colchicine, NSAID.	Yes
		Case 2		19	Male	Pfizer-BioNTech.	Second	NR	24	Myocarditis presented with squeezing chest pain and dyspnea.	Colchicine, NSAID.	Yes
		Case 3		19	Male	Pfizer-BioNTech.	Second	Lung disease	24	Myocarditis presented with fever and malaise, squeezing chest pain radiating to the back.	Colchicine, β -blocker	Yes
		Case 4		22	Male	Pfizer-BioNTech.	Second	NR	120	Myocarditis presented with stabbing chest pain aggravated by lying down, myalgia, headache, and malaise.	Colchicine.	Yes
		Case 5		24	Male	Pfizer-BioNTech.	Second	NR	48	Atrial fibrillation presented with a rapid ventricular rate and occasional premature ventricular beats with palpitations and chest pain.	The patient received medication for sinus rhythm conversion and rate control.	NO
		Case 6		21	Male	Pfizer-BioNTech.	Second	NR	120	Myocardial infarction presented with central chest pain radiating to left shoulder and neck, with facial numbness.	Treated as STEMI with heparin, dual antiplatelet, coronary stent and thrombolysis.	Yes
		Case 7		18	Male	Pfizer-BioNTech.	Second	NR	48	Myopericarditis presented with chest pain	Colchicine, NSAID.	Yes
Li 2021 [78]	Case report	1	China	31	Male	Sinopharm.	First	NR	8	Myocarditis presented with chest pain and dyspnea	Colchicine, NSAID.	Yes
Maadarani 2021 [79]	Case report	1	Kuwait	62	Female	AstraZeneca.	First	CVD, Hypertension, DM	1.5	Myocarditis presented with chest pain and dyspnea	Colchicine, NSAID.	Yes
Manfredi 2022 [80]	Case series	Case 1	Italy	17	Female	Pfizer-BioNTech.	Second	NR	NR	Myopericarditis Presented with dyspnea	Colchicine, NSAID.	Yes
		Case 2		18	Male	Pfizer-BioNTech.	Second	NR	NR	Myocarditis presented with chest pain and dyspnea	Colchicine, NSAID.	Yes
		Case 3		25	Male	Moderna.	Second	NR	NR	Myocarditis.	Colchicine, NSAID.	Yes
		Case 4		16	Female	Moderna.	Second	NR	NR	Myocarditis presented with chest pain and cough	NR	Yes
		Case 5		15	Male	Pfizer-BioNTech.	Second	NR	NR	Myocarditis	NR	Yes

										Presented with chest pain and fever		
		Case 6		14	Male	Pfizer-BioNTech.	Second	NR	NR	Myocarditis Presented with chest pain and a cough	IVIg, meth prednisone	Yes
Mansour 2021[81]	Case series	Case 1	USA	25	Male	Moderna.	Second	NR	24	Myocarditis presented with chest pain and a cough	Ketorolac, colchicine, aspirin	Yes
		Case 2		21	Female	Moderna.	Second	NR	24	Myocarditis Presented with dyspnea and fever	Ibuprofen	Yes
Marshall 2021[82]	Case series	Case 1	USA	16	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain	IVIg, meth prednisone, ibuprofen	Yes
		Case 2		19	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis	IVIg, methyl prednisone, ibuprofen	Yes
		Case 3		17	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain and cough	Prednisone, IVIG	Yes
		Case 4		18	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis	NSAID, furosemide	Yes
		Case 5		17	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with palpitation, and tachycardia.	Propranolol.	Yes
		Case 6		16	Male	Pfizer-BioNTech.	Second	NR	72	Myopericarditis presented with sharp, stabbing midsternal chest pain radiating to the left arm.	Four-dose series of intravenous immunoglobulin and provided ibuprofen for symptomatic relief with a resolution of chest pain. He was sent home on a 7-day course scheduled ibuprofen and famotidine.	Yes
		Case 7		14	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with palpitations and shortness of breath.	Prednisone, Omeprazole, Bisoprolol, Ramipril, Sulfamethoxazole /Trimethoprim.	Yes
Marsukjai 2022[83]	Case report	1	Thailand	55	Female	AstraZeneca.	Second	CVS, hypertension	336	Myocarditis was complicated by cardiogenic shock and presented with tachycardia, hypotension, coldness of the extremities, extreme asthenia, headache, and fever.	Norepinephrine, dobutamine, and steroids.	Yes
McLean 2021[84]	Case report	1	USA	16	Male	Pfizer-BioNTech.	Second	NR	60	Myocarditis presented with chest pain and dyspnea and cough	NSAID	Yes
Mengesha 2022[85]	Case report	1	Palestine	43	Female	Pfizer-BioNTech.	Third.	Others	48	Myocarditis presented with central crushing chest pain and dyspnea and cough.	Aspirin, colchicine, ramipril, and proton pump inhibitors.	Yes
Mimouni 2022[86]	Case report	1	Morocco	14	Male	Pfizer-BioNTech.	First.	NR	240	Pericarditis presented with dyspnea, and tachycardia cough.	Prednisolone.	Yes
Minocha 2021[87]	Case report	1	USA	17	Male	Pfizer-BioNTech.	Second	NR	48	Subacute pleuropericarditis presenting with SOB	Percutaneous pericardial and right and left thoracic drainages were performed. Colchicine was given during hospital stay.	Yes
Miqdad 2021[88]	Case report	1	SAU	18	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis Presented with dyspnea and fever	NR	Yes
Misumi 2022[89]	Case report	1	Japan	59	Male	Pfizer-BioNTech.	First.	Lung disease, others	120	Myocarditis Presented with chest pain and dyspnea and cough	NR	Yes

Mizoguchi 2022[90]	Case report	1	Japan	88	Female	Pfizer-BioNTech.	Second	NR	72	Myopericarditis presented with midsternal chest pain exacerbated by deep breathing.	NSAIDs, colchicine, and pantoprazole.	Yes
Moosmann 2022[91]	Case series	Case 1	New Zealand	14	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis Presented with cough and fever and dyspnea	Colchicine, ibuprofen	Yes
		Case 2		12	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain and a cough	Colchicine, ibuprofen	Yes
Morton 2021[92]	Case report	1	USA	16	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain and dyspnea	Lisinopril, carvedilol	Yes
Murakmi 2022[93]	Case series	Case 1	Japan	27	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain and fever and dyspnea	Nonsteroidal anti-inflammatory drugs.	Yes
		Case 2		38	Male	Pfizer-BioNTech.	First		216	Myocarditis presented with pressuring chest pain worsening with inspiration, tachycardia, and malaise.	The patient was treated with immunosuppressive treatment; methyl-prednisolone, prednisolone, and mycophenolate mofetil in combination with enalapril, carvedilol, and spironolactone for heart failure.	Yes
Muthukumar 2021[94]	Case report	1	USA	52	Male	Moderna.	Second	Hypertension	72	Pericarditis complicated by right-sided heart failure and presented with weight gain, peripheral edema, and dyspnea on effort	diuretics and anti HF therapy.	Yes
Nagasaka 2021[95]	Case report	1	Japan	23	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain and dyspnea and cough	Vasopressors, antibiotics	NO
Naghashzadeh 2022[96]	Case report	1	Iran	29	Male	Sputnik V.	Second	NR	48	Myocarditis presented with midsternal burning chest pain without radiation, myalgia, fatigue, and fever.	NR	Yes
Nakanishi 2022[97]	Case report	1	Japan	70	Female	Pfizer-BioNTech.	Second	CVS, lung disease, hypertension, DM	168	Myocarditis Presented with chest pain and dyspnea	beta blocker, an AT1 antagonist	Yes
Nassar 2021[98]	Case report	1	USA	70	Female	Johnson & Johnson.	First	Immune disease	48	Myopericarditis Presented with chest pain, cough, and dyspnea	NR	Yes
Nguyen 2021[99]	Case report	1	Germany	20	Male	Moderna.	First	NR	12	Myocarditis presented with chest pain and dyspnea	ibuprofen, heart failure therapy	Yes
Nunn 2022[100]	Case series	Case 1	Germany	31	Female	Pfizer-BioNTech.	First	NR	408	Myopericarditis presented with chest pain and dyspnea and fever	NR	Yes
		Case 2		47	Male	Pfizer-BioNTech.	Second	Immune disease	144	Myocarditis presented with acute substernal chest pain.	Acetaminophen, and antitussives.	Yes
		Case 3		16	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis (fulminant) presented with syncope and resting chest pain, hypotension complicated by cardiogenic shock, and an atrioventricular block.	Pulse steroid therapy, inotropes, temporary transvenous pacemaker, and HF therapy (bisoprolol, spironolactone, and sacubitril valsartan).	Yes
		Case 4		24	Male	Moderna.	Second	NR	96	Myopericarditis presented with chest pain radiating to the left arm and bilateral	Tylenol, metoprolol, and colchicine.	Yes

										shoulders, and tachycardia.		
Ohnishi 2022[101]	Case report	1	Japan	26	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis presented with chest discomfort and worsening dyspnea then ventricular fibrillation cardiac arrest and complicated by acute kidney	CPR for arrest then norepinephrine and milrinone perfusion, intravenous methylprednisolone, mechanical ventilation, and renal replacement therapy.	Yes
Oka 2022[102]	Case report	1	Japan	50	Male	Moderna.	Second	NR	240	Myocarditis (fulminant) presented with syncope and resting chest pain, hypotension complicated by cardiogenic shock, and an atrioventricular block.	Colchicine, NSAID, β -blocker	Yes
Olagunju 2022[103]	Case report	1	USA	19	Male	Moderna.	Second	Lung disease	48	Myocarditis presented with chest pain worse with inspiration, jaw pain, malaise, and myalgias	B-blocker	Yes
Olmos 2022[104]	Case report	1	NR	49	Female	Pfizer-BioNTech.	Second	NR	144	Myocarditis presented with chest pain and dyspnea and cough	B-blocker	Yes
Onderko 2021[105]	Case series	Case 1	US	25	Male	Pfizer-BioNTech.	Second	Immune disease	96	Myocarditis presented with chest pain and dyspnea and cough and fever.	None.	Yes
		Case 2		28	Male	Pfizer-BioNTech.	Second	NR	72	Myopericarditis presented with retrosternal, constrictive chest pain.	IV immunoglobulin.	Yes
		Case 3		36	Male	Moderna.	Second	NR	48	Myocarditis presented with mid-sternal, non-radiating chest pain associated with chest tightness and tachycardia.	None	Yes
Pantsois 2022[106]	Case report	1	Greece	50	Male	Pfizer-BioNTech.	Second	NR	71	Myocarditis presented with mid-sternal, non-radiating chest pain associated with chest tightness and tachycardia.	Colchicine, NSAID, steroids, IV immunoglobulin.	No
Park 2021[107]	Case series	Case 1	US	15	Male	Pfizer-BioNTech.	First	NR	72	Myocarditis tachycardia, hypotension, left arm pain, and decompensated heart failure.	Colchicine, NSAID, steroids.	Yes
		Case 2		16	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with dyspnea and cough	Colchicine, NSAID, steroids, IV immunoglobulin.	Yes
Parmar 2021[108]	Case series	Case 1	US	53	Female	Moderna.	First	CVD	144	Myocarditis presented with chest pain and dyspnea and cough.	Colchicine, NSAID, steroids	Yes
		Case 2		22	Male	Moderna.	Second	Lung disease	72	Myocarditis presented with tachycardia and chest pain and dyspnea and cough and fever.	Ibuprofen and colchicine.	Yes
		Case 3		19	Male	Moderna.	Second	NR	96	Myocarditis presented with retrosternal chest pain.	Aspirin, colchicine.	Yes
		Case 4		22	Male	Moderna.	Second	Lung disease	72	Myopericarditis presented with chest pain worsened with lying fat and improved with sitting upright.	Colchicine and high-dose ibuprofen.	Yes
pasha 2022[109]	Case report	1	USA	45	Male	Moderna.	Second	NR	48	Myopericarditis presented with chest pain		Yes

										worsened with inspiration and was associated with dyspnea, nausea, and vomiting.		
Patel 2021[110]	Case series	Case 1	US	22	Male	Pfizer-BioNTech.	First	NR	48	Myopericarditis presented with chest pain and dyspnea.	None	Yes
		Case 2		19	Male	Pfizer-BioNTech.	Second	Lung disease	21	Myopericarditis Presented with chest pain and dyspnea	Colchicine, NSAID, ACE inhibitor, β -blocker	Yes
		Case 3		25	Male	Moderna.	Second	NR	72	Myopericarditis presented with chest pain radiating to the left arm.	Non-steroidal anti-inflammatory drugs.	Yes
		Case 4		37	Male	Pfizer-BioNTech.	Second	NR	48	Myopericarditis presented with chest pain and dyspnea.	Lisinopril.	Yes
		Case 5		20	Male	Pfizer-BioNTech.	Second	NR	72	Myopericarditis presented with epigastric pain, sweating, tachycardia, and hypotension.	Enalapril.	Yes
Patrignani 2021[111]	Case report	1	Italy	56	Male	Pfizer-BioNTech.	First	NR	96	Myocarditis presented with chest pain and dyspnea and cough and fever	Ramipril	Yes
Puchalski 2022[112]	Case series	Case 1	Poland	15	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain	Ramipril	Yes
		Case 2		17	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain	Ramipril	Yes
		Case 3		17	Male	Pfizer-BioNTech.	First	NR	48	Myocarditis presented with chest pain and dyspnea	Ibuprofen and colchicine.	Yes
		Case 4		17	Male	Pfizer-BioNTech.	First	NR	72	Myocarditis Presented with fever, cough, and dyspnea	NR	Yes
		Case 5		17	Male	Pfizer-BioNTech.	First	NR	552	Myopericarditis presented with central pleuritic chest pain, and tachycardia.	β -blocker, ACE inhibitor, aspirin, antiplatelet	Yes
Riddell 2022[113]	Case report	1	New Zealand	18	Male	Pfizer-BioNTech.	Second	NR	15	Myocarditis presented with dyspnea and cough	β -blocker, angiotensin receptor blocker, statin.	Yes
Riedel 2021[114]	Case report	1	Brazil	47	Male	Sinovac	Second	DM	1008	Myocarditis presented with chest pain at rest, no pleuritic, and non-exertional.	steroids	Yes
Rosner 2021[115]	Case series	Case 1	US	28	Male	Johnson & Johnson.	NR	NR	120	Myocarditis presented with chest pain associated with shortness of breath; worse when lying flat and with inspiration.	Colchicine, NSAID, (famotidine.)	Yes
		Case 2		39	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with fever, chills, shortness of breath, and chest heaviness/pain.	Colchicine, NSAID, (famotidine.)	Yes
		Case 3		39	Male	Moderna.	Second	NR	96	Myocarditis presented with intermittent, positional chest pain with left arm numbness and tingling.	Ibuprofen, famotidine.	Yes
		Case 4		24	Male	Pfizer-BioNTech.	First	NR	168	Myocarditis presented with midsternal sharp chest pain, waxing/ and positional; relieved with leaning forward.	β -blocker, colchicine.	Yes
		Case 5		19	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with	Diuretics, aspirin	Yes

										midsternal chest pain with deep inspiration.		
		Case 6		20	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with subjective fevers, diffuse myalgia, and headache starting day of vaccination; sudden onset of sharp chest pain worsened when lying flat.	Supportive therapies.	Yes
		Case 7		23	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis	NSAIDs	Yes
Sakaguchi 2021[116]	Case report	1	Japan	49	Male	Pfizer-BioNTech.	Second	NR	264	Myocarditis presented with chest pain and atrial fibrillation.	NSAIDs	Yes
Sano 2022[117]	Case report	1	Japan	20	Male	Moderna.	Second	NR	48	Myocarditis presented with dyspnea and fever and cough	IVIg, NSAIDs	Yes
Schauer 2021[118]	Case series	Case 1	USA	16	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain and dyspnea and cough	NSAIDs	Yes
		Case 2		16	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain	NSAIDs	Yes
		Case 3		16	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain	NSAIDs	Yes
		Case 4		17	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain	NSAIDs	Yes
		Case 5		15	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain	IVIg, corticosteroids	Yes
		Case 6		15	Female	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain	NSAIDs	Yes
		Case 7		15	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain	NSAIDs	Yes
		Case 8		15	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis	NSAIDs	Yes
		Case 9		12	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis	IVIg, corticosteroids, NSAIDs	Yes
		Case 10		14	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis Presented with cough and dyspnea	NSAIDs	Yes
		Case 11		14	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis Presented with chest pain and fever and cough	NR	Yes
		Case 12		16	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain	Beta-blockers, angiotensin-converting enzyme inhibitors, antagonists of mineralocorticoid receptors, and NSAIDs	Yes
		Case 13		15	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis Presented with dyspnea	Beta-blockers, angiotensin-converting enzyme inhibitors, antagonists of mineralocorticoid receptors, and NSAIDs	yes
Schmitt 2021[119]	Case report	1	France	19	Male	Pfizer-BioNTech.	Second	NR	72	Myopericarditis presented with chest pain, exacerbated with breathing.	The patient underwent successful dual-chamber permanent pacemaker placement.	Yes
Sciaccaluga 2022[120]	Case series	Case 1	Italy	20	Male	Moderna.	Second	NR	72	Myopericarditis presented with chest pain, exacerbated with breathing.	Aspirin, colchicine, and indomethacin.	Yes
		Case 2		21	Male	Moderna.	Second	NR	72	Transient heart block presented with multiple episodes of dizziness, and	Aspirin, indomethacin, and colchicine.	Yes

										shortness of breath.		
Shams 2021[121]	Case report	1	Pakistan	80	Male	Sinopharm.	First	CVD, Hypertension	120	Myopericarditis presented with flu-like symptoms of fatigue, myalgia, and progressive sharp substernal chest pain.	NR	Yes
Sharbatdaran 2022[122]	Case report	1	USA	25	Male	Moderna.	Second	NR	72	Myopericarditis presented with sharp substernal chest pain, periumbilical pain and RUQ tenderness on palpation.	NR	Yes
Sharff 2022[123]	Case series	Case 1	USA	21	Male	Pfizer-BioNTech.	Third	NR	72	Myocarditis Presented with dyspnea	NR	Yes
		Case 2		21	Male	Pfizer-BioNTech.	Third	NR	72	Myocarditis presented with chest pain and a cough	NR	Yes
		Case 3		27	Male	Pfizer-BioNTech.	Third	NR	72	Myocarditis presented with chest pain and dyspnea	NR	Yes
		Case 4		35	Female	Pfizer-BioNTech.	Third	NR	48	Myocarditis	NR	Yes
		Case 5		21	Female	Johnson & Johnson.	Second	NR	96	Myocarditis with fever and malaise and cough	NR	Yes
		Case 6		35	Male	Pfizer-BioNTech.	Third	NR	456	Myocarditis presented with chest pain and fever and cough.	NR	Yes
Shiyovich 2022[124]	Case series	Case 1	Isreal	21	Male	Pfizer-BioNTech.	Third	NR	96	Myocarditis presented with chest pain and fever and cough.	NR	Yes
		Case 2		44	Female	Pfizer-BioNTech.	Third	NR	48	Myocarditis presented with chest pain and dyspnea.	acetylsalicylic	Yes
		Case 3		26	Male	Pfizer-BioNTech.	Third	Lung Disease	336	Myocarditis presented with chest pain and dyspnea.	acid, methylprednisolone, antibiotics	Yes
		Case 4		18	Male	Pfizer-BioNTech.	Third	NR	72	Myocarditis presented with cough	NR	Yes
Shumkova 2021[125]	Case report	1	Bulgaria	23	Male	Pfizer-BioNTech.	Second	NR	24	Myocarditis presented with chest pain, left-sided, constant, non-radiating, a headache. Fever and chills on the day the dose resolved.	Colchicine was substituted with methylprednisolone and prednisone due to complications	Yes
Singh 2021[126]	Case report	1	USA	24	Male	Pfizer-BioNTech.	Second	NR	72	Pericarditis with chest pain worsening on lying flat and dyspnea	NR	Yes
Singh 2022[127]	Case report	1	USA	69	Female	Moderna.	Second	Hypertension, DM, and CKD	24	Myopericarditis presented with chest pain and dyspnea and cough	NR	Yes
Snapiri 2021[128]	Case series	Case 1	Israel	17	Male	Pfizer-BioNTech.	Second	NR	72	Myopericarditis Presented with cough and dyspnea and chest pain	NR	Yes
		Case 2		16	Male	Pfizer-BioNTech.	Second	NR	24	Myopericarditis	NR	Yes
		Case 3		16	Male	Pfizer-BioNTech.	Second	NR	48	Myopericarditis presented with chest pain	NR	Yes
		Case 4		16	Male	Pfizer-BioNTech.	Second	NR	72	Myopericarditis	NR	Yes
		Case 5		17	Male	Pfizer-BioNTech.	Second	NR	24	Myopericarditis presented with chest pain	NR	Yes
		Case 6		16	Male	Pfizer-BioNTech.	First	NR	48	Myopericarditis Presented with cough and fever	NR	Yes
		Case 7		17	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain and a cough	NR	Yes
Sokolska 2021[129]	Case report	1	Poland	21	Male	Pfizer-BioNTech.	First	Lung disease	72	Myocarditis	NR	Yes

										Presented with chest pain, dyspnea, cough, and fever		
Starekova 2021[130]	Case series	Case 1	USA	21	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain	NR	Yes
		Case 2		32	Female	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with chest pain and dyspnea	NR	Yes
		Case 3		17	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis Presented with fever, cough, and chest pain	NR	Yes
		Case 4		18	Male	Moderna.	Second	NR	72	Myocarditis	NR.	Yes
		Case 5		38	Male	Moderna.	Second		72	Takotsubo cardiomyopathy presented with intermittent sharp central chest pain radiating between her scapulae, diaphoresis, dyspnea, and vomiting.	Symptomatic treatment.	Yes
Stewart 2021[131]	Case report	1	UK	50	Female	AstraZeneca.	Second	Lung disease	168	Myocarditis presented with substernal chest pain, with chills and myalgia, initially resolved.	PCI	Yes
Sulemankhil 2021[132]	Case report	1	USA	33	Male	Johnson & Johnson.		Lung disease	48	Myocardial infarction presented with left shoulder pain that later progressed to left-sided chest pain.	PCI	Yes
Sung 2021[133]	Case series	Case 1	US	68	Female	Moderna.	First	CVD, Hypertension	24	Myocardial infarction presented with chest and shoulder pain that radiated to the jaw and dyspnea.	NSAIDs	Yes
		Case 2		42	Male	Moderna.	First	CVD	12	Myopericarditis presented with cough and dyspnea	NSAIDs, doxycycline	Yes
Tano 2021[134]	Case series	Case 1	USA	17	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis presented with chest pain and dyspnea	IVIG, NSAIDs	Yes
		Case 2		16	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with cough and fever and dyspnea	NR	Yes
		Case 3		17	Male	Pfizer-BioNTech.	First and second	NR	72	Myopericarditis presented with cough and dyspnea	NR	Yes
		Case 4		15	Male	Pfizer-BioNTech.	First	NR	48	Myopericarditis presented with chest pain	NR	Yes
		Case 5		16	Male	Pfizer-BioNTech.	Second	NR	24	Myopericarditis presented with chest pain	NSAIDs, azithromycin	Yes
		Case 6		15	Male	Pfizer-BioNTech.	Second	DM	48	Myopericarditis presented with chest pain	NSAIDs	Yes
		Case 7		15	Male	Pfizer-BioNTech.	Second	NR	72	Myopericarditis presented with chest pain	Three liters of lactated ringers, lorazepam, and Tylenol were also administered. Despite all these measures, the tachycardia persisted. The patient was given a dose of metoprolol orally.	Yes
		Case 8		17	Male	Pfizer-BioNTech.	Second	NR	24	Isolated tachycardia.	Ibuprofen and colchicine.	Yes
Tate 2021[135]	Case report	1	USA	29	Female	Pfizer-BioNTech.	Second	NR	8	Myopericarditis presented with pleuritic chest pain, fever, headache, tachycardia, myalgias, and dyspnea	Anticoagulant and supportive therapy.	Yes
Tinoco 2021[136]	Case report	1	Portugal.	39	Male	Pfizer-BioNTech.	Second	NR	72	Takotsubo cardiomyopathy presented with	NSAIDs	Yes

										hypotension during dialysis		
Toida 2022[137]	Case report	1	Japan	80	Female	Pfizer-BioNTech.	First.	Hypertension, CKD,	96	Myocarditis with cough and dyspnea and fever	Cardiopulmonary resuscitation.	Yes
Türe 2022[138]	Case report	1	Turkey	14	Male	Pfizer-BioNTech.	Second	NR	72	Myocarditis presented with cardiac arrest.	loxoprofen.	Yes
Uesako 2022[139]	Case report	1	Japan	26	Male	Pfizer-BioNTech.	First.	NR	120	Myopericarditis presented with fever and severe sharp chest pain in deep breathing, improved by sitting up.	Inotropes, diuretics, methyl prednisone, heart failure medication	No
Umei 2022[140]	Case report	1	Japan	20	Male	Moderna.	Second	NR	48	Myocarditis Presented with cough and dyspnea	NR	Yes
Verma 2021[141]	Case series	Case 1	USA	45	Female	Pfizer-BioNTech.	First	NR	240	Myocarditis Presented with chest pain and dyspnea and fever	Ibuprofen, prednisone, and colchicine.	Yes
		Case 2		42	Male							
viani 2022[142]	Case report	1	Italy	59	Male	Pfizer-BioNTech.	Second	DM	120	Myopericarditis presented with substernal chest pain, dyspnea, nausea,	Colchicine, metoprolol, ibuprofen	Yes
WALTERS 2021[143]	Case report	1	USA	29	Male	Pfizer-BioNTech.	Second	NR	96	Myocarditis presented with Dyspnea, cough, and fever	High-dose aspirin, colchicine, bisoprolol, and Ramipril.	Yes
Watkins 2021[144]	Case report	1	USA	20	Male	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with dull, retrosternal, positional, pleuritic chest pain, tachycardia, tachypnea, and decompensated heart failure.	Prednisone, ibuprofen, and colchicine.	Yes
Williams 2021[145]	Case report	1	Canada	34	Male	Moderna.	Second	NR	24	Myocarditis presented with pleuritic chest pain and dyspnea.	Norepinephrine, furosemide, losartan, ivabradine, colchicine, and spironolactone	Yes
Wu A 2022[146]	Case report	1	USA	40	Male	Pfizer-BioNTech.	First.	NR	72	Myopericarditis (fulminant) presented with stabbing chest pain, shortness of breath, nausea, vomiting, abdominal distension, hypotension	The pain was not relieved by any medications and resolved on its own after 36h.	Yes
Wu B 2022[147]	Case report	1	Taiwan	44	Female	AstraZeneca.	First	NR	48	left arm pain (injected arm), then axilla, then migrated to chest mimicking heart attack.	Methylprednisolone, prednisone, bisoprolol, spironolactone, enalapril, amiodarone, Impella CP, and veno-arterial extracorporeal membrane oxygenation	Yes
Xinias 2022[148]	Case report	1	Greece	56	Male	Pfizer-BioNTech.	Second	NR	120	Myocarditis presented with dyspnea and fever	Methylprednisolone, prednisone, bisoprolol, spironolactone, intra-aortic balloon pumping	Yes
Yamaura 2022[149]	Case report	1	Japan	30	Female	Pfizer-BioNTech.	Second	NR	48	Myocarditis presented with chest pain and cough and fever	Methylprednisone, prednisone, colchicine	Yes
Yamamoto 2022[150]	Case series	Case 1	Japan	41	Male	Moderna.	Second	NR	456	Myocarditis presented with dyspnea and cough	Prednisone, NSAIDs, colchicine	Yes

	Case 2	18	Female	Pfizer-BioNTech.	First	NR	216	Myocarditis presented with cough, and fever	NR	Yes
	Case 3	18	Male	Moderna.	Second	NR	48	Reverse Takotsubo cardiomyopathy	Treatment	NO
	Case 4	18	Male	Moderna.	Second	NR	72	Myocarditis presented with chest pain	IVIg, IV steroids	Yes

US= United States; CVD= cardiovascular disease; DM= Diabetes Miletus; CKD= chronic kidney disease; NR: not reported

ACE inhibitor = angiotensin-converting enzyme inhibitor; ARB = Angiotensin receptor blocker; NSAID = non-steroidal anti-inflammatory drug;

PCI = Percutaneous coronary intervention

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Mansour 2021[22]	YES	YES	NR	NO	YES	YES	NR	NO	YES	Fair (5)
Marshall 2021[23]	YES	YES	YES	YES	YES	YES	NO	NO	YES	Good (7)
Moosmann 2022[24]	YES	YES	YES	YES	YES	YES	YES	NO	YES	Good (8)
Murakami 2022[25]	YES	YES	YES	NO	YES	YES	YES	NO	YES	Good (7)
Nunn 2022[26]	YES	YES	NR	YES	YES	YES	NR	NO	YES	Fair (6)
Onderko 2021[27]	YES	YES	NO	YES	YES	YES	NR	NO	YES	Good (7)
Park 2021[28]	YES	YES	NR	YES	YES	YES	NR	NO	YES	Good (7)
Parmar 2022 [29]	YES	YES	YES	YES	YES	YES	YES	NO	YES	Good (8)
Patel 2021[30]	YES	YES	NR	YES	YES	YES	YES	NO	YES	Good (7)
Puchalski 2022[31]	YES	YES	YES	YES	YES	YES	YES	NO	YES	Good (8)
Rosner 2021[32]	YES	YES	NR	YES	YES	YES	YES	NO	YES	Good (7)
Schauer 2021[33]	YES	YES	YES	YES	YES	YES	YES	NO	YES	Good (8)
Sciaccaluga 2022[34]	YES	YES	YES	NO	YES	YES	YES	NO	YES	Good (7)
Sharff 2022[35]	YES	NO	NR	YES	YES	NO	YES	NO	NO	Fair (4)
Shiyovich 2022[36]	YES	YES	YES	YES	YES	YES	NO	YES	YES	Good (8)
Snapiiri 2021[37]	YES	YES	YES	YES	YES	YES	NR	NO	YES	Fair (6)
Starekova 2021[38]	YES	YES	YES	YES	YES	YES	NR	NO	YES	Good (7)
Sung 2021[39]	YES	YES	YES	YES	YES	YES	NR	NO	YES	Good (7)
Tano 2021[40]	YES	YES	NR	YES	YES	YES	NR	NO	NO	Fair (5)
Yamamoto 2022[41]	YES	YES	NR	YES	YES	YES	NR	NO	YES	Fair (6)

NR: Not Reported **Good:** Met 7–9 criteria, **Fair:** Met 4–6 criteria, **Poor:** Met 0–3 criteria., **NIH** = National Institutes of Health.

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Supplemental Table 3. Quality Assessment of Included Case Report Studies using The Joanna Briggs Institute (JBI) Critical Appraisal checklist.

The Joanna Briggs Institute (JBI) Critical Appraisal checklist for Case Reports									
Study ID	Were the patient's demographic characteristics clearly described?	Was the patient's history clearly described and presented as a timeline?	Was the current clinical condition of the patient on presentation clearly described?	Were diagnostic tests or assessment methods and the results clearly described?	Was the intervention(s) or treatment procedure (s) clearly described?	Was the post-intervention clinical condition clearly described?	Were adverse events (harms) or unanticipated events identified and described?	Does the case report provide takeaway lessons?	Quality (Total Quality Score)
Agdamag 2022 [1]	YES	YES	YES	YES	YES	YES	NA	YES	87%
Alania-Torres 2021[2]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Albert 2021[3]	YES	YES	YES	YES	YES	NO	NO	YES	75%
Alizadeh 2022[4]	YES	NO	YES	YES	YES	YES	NO	YES	88%
Anthony 2022[5]	YES	YES	YES	YES	Yes	YES	NO	YES	88%
Ashaari 2021[6]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Azdaki 2021[7]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Azir 2021[8]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Bartlett 2021[9]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Boivin 2021 [10]	YES	YES	YES	YES	YES	NO	NO	YES	75%
Brage 2022[11]	YES	YES	YES	YES	YES	NO	NO	YES	75%
Cereda 2021[12]	YES	NO	YES	YES	YES	YES	YES	YES	87%
Chachar 2021[13]	YES	NO	YES	YES	YES	NO	NO	YES	63%
Calderón-Colmenero 2021[14]	YES	NO	YES	YES	YES	YES	NA	YES	75%
Chatterjee 2021[15]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Chellapandian 2022[16]	YES	YES	YES	YES	YES	NR	NO	YES	75%
Choi 2021[17]	YES	NO	YES	YES	YES	YES	NA	YES	75%
Chow 2022[18]	YES	YES	YES	YES	YES	YES	NO	YES	75%
Crane 2021[19]	YES	YES	YES	YES	YES	YES	NO	YES	75%
D'Angelo 2021[20]	YES	NO	YES	YES	YES	YES	NA	YES	75%
Deb 2021[21]	YES	NO	YES	YES	YES	YES	NA	YES	75%

Dlewati 2022[22]	YES	NO	YES	YES	YES	YES	NA	YES	75%
Ehrlich 2021[23]	YES	NO	YES	YES	YES	YES	NA	YES	75%
Elhouderi 2022[24]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Etuk 2022[25]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Fadah 2022[26]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Farooq 2022[27]	YES	YES	YES	YES	NO	NO	NO	YES	63%
Fearon 2021[28]	YES	NO	YES	YES	YES	YES	NO	YES	75%
Fosch 2022[29]	YES	YES	YES	YES	YES	YES	NA	YES	87%
Fritz 2022[30]	YES	YES	YES	YES	YES	YES	NO	YES	75%
Generette 2022[31]	YES	YES	YES	YES	YES	YES	NO	YES	75%
Gill A [32]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Gomes 2022[33]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Hajsadeghi 2022[34]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Hasnie 2021[35]	YES	NO	YES	YES	YES	YES	NO	YES	75%
Hassanzadeh 2022[36]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Hirsch 2022[37]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Horiuchi 2022[38]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Hung 2022[39]	YES	YES	YES	YES	YES	NO	NO	YES	75%
Iqbal 2021[40]	YES	NO	YES	YES	YES	YES	NO	YES	88%
Issak 2021[41]	YES	NO	YES	YES	YES	NO	NA	YES	63%
Iwamuro 2022[42]	YES	YES	YES	YES	YES	NO	NO	YES	63%
Javed 2022[43]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Kadwalwala 2021[44]	YES	YES	YES	YES	YES	YES	NA	YES	87%
Kaneta 2022[45]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Kang 2022[46]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Kawakami 2022[47]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Kevin Lee 2022[48]	YES	YES	YES	YES	YES	YES	NO	YES	75%

Khan 2022[49]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Kim 2021 A[50]	YES	NO	YES	YES	YES	YES	NO	YES	75%
Kim 2021 B[51]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Kimball 2022[52]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Kimura 2022[53]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Kojima 2022[54]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Kokawa 2022[55]	YES	NO	YES	NO	NO	NO	NO	YES	38%
Kyaw 2022[56]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Lee 2022[57]	YES	NO	NO	NO	NO	NO	NA	NO	13%
Li 2020[58]	YES	NO	NO	YES	NO	YES	NO	YES	50%
Maadarani 2021[59]	YES	NO	YES	YES	YES	YES	NO	YES	75%
Marsukjai 2022[60]	YES	YES	YES	YES	YES	YES	NO	YES	88%
McLean 2021[61]	YES	NO	YES	YES	YES	YES	NO	YES	75%
Mengesha 2022[62]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Mimouni 2022[63]	YES	YES	YES	YES	YES	YES	YES	YES	100%
Minocha 2021[64]	YES	NO	YES	YES	YES	YES	NA	YES	75%
Miqdad 2021[65]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Misumi 2022[66]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Mizoguchi 2022[67]	YES	YES	YES	YES	YES	YES	YES	YES	100%
Morton 2021[68]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Muthukumar 2021[69]	YES	NO	YES	YES	YES	YES	NA	YES	63%
Nagasaka 2022[70]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Naghashzadeh 2022[71]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Nakanishi 2022[72]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Nassar 2021[73]	YES	NO	YES	YES	YES	YES	NA	YES	63%
Nguyen 2021[74]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Ohnishi 2022[75]	YES	YES	YES	YES	YES	YES	YES	YES	100%
Oka 2022[76]	YES	YES	YES	YES	YES	YES	NO	YES	88%

Olagunju 2022[77]	YES	YES	YES	YES	YES	NO	NO	YES	75%
Olmos 2022[78]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Pantsois 2022[79]	YES	YES	YES	YES	YES	YES	YES	YES	100%
Pasha 2022[80]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Patrignani 2021[81]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Riddell 2022[82]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Riedel 2021[83]	YES	YES	YES	YES	YES	YES	NA	YES	87%
Sakaguchi 2022[84]	YES	NO	NO	YES	YES	NO	NA	YES	50%
Sano 2022[85]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Schmitt 2021[86]	YES	NO	YES	YES	YES	YES	NA	YES	75%
Shams 2021[87]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Sharbatdaran 2022[88]	YES	YES	YES	YES	YES	NO	NO	YES	75%
Shumkova 2021[89]	YES	NO	YES	YES	YES	NO	NA	YES	63%
Singh 2021[90]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Singh 2022[91]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Sokolska 2021[92]	YES	NO	YES	YES	YES	NO	NA	YES	63%
Stewart 2021[93]	YES	YES	YES	YES	NO	YES	NO	YES	75%
Sulemankhil 2022[94]	YES	NO	YES	YES	YES	NO	NO	YES	63%
Tate 2021[95]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Tinoco 2021[96]	YES	YES	YES	YES	NO	YES	NO	YES	75%
Toida 2022[97]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Ture 2022[98]	YES	YES	YES	YES	YES	YES	NA	YES	87%
Uesako 2022[99]	YES	YES	YES	YES	NO	YES	NO	YES	75%
Umei 2022[100]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Verma 2021[101]	YES	NO	YES	YES	YES	YES	NA	YES	63%
Viani 2022[102]	YES	YES	YES	YES	NO	YES	NO	YES	75%
Walters 2021[103]	YES	YES	YES	YES	YES	YES	NO	YES	88%

Watkins 2021[104]	YES	NO	YES	YES	YES	YES	NA	YES	63%
Williams 2021[105]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Wu 2021[106]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Wu 2022[107]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Xinias 2022[108]	YES	YES	YES	YES	YES	YES	NO	YES	88%
Yamaura 2022[109]	YES	NO	YES	YES	YES	NO	NA	YES	63%

NA: not applicable, **Good:** More than 70%, **Fair:** More than 50%, **Poor:** Less than 50%

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Supplementary Material Table 4. Comparison with Previous Studies.

	Ling 2022 ¹	Lee 2022 ²	Park 2022 ³	Behers 2022 ⁴	Bellos 2022 ⁵	Chou 2022 ⁶	Ahmed 2022 ⁷	Our study
Methodology of search								
Electronic databases	MEDLINE, Embase, Cochrane, Scopus	PubMed, LitCovid and the Cochrane COVID-19 Study Register	PUBMED and MEDLINE	PubMed, Cochrane, Web of Science, and Embase.	Medline, Scopus, Web of Science, CENTRAL, and Google Scholar	PubMed, Embase, and several Latin American databases	(PubMed and Google Scholar)	PubMed, Scopus, Cochrane Library, and Web of Science
Quality of included studies	All studies were of good quality	NR	NR	The average risk bias assessment score for the included case reports for this study was 6.8/8.	The reporting of cases was evaluated as adequate in the majority (89.7%) of studies.	NR	NR	88.5% of included studies have good quality.
Number of studies	22	52	57	53	39	39	62	150
Number of cases	NR	200	275	53	129	343	218	349
The design of studies included	Observational studies	Case series, case reports, and letters to the editor.	Case reports, case series, and summated case series	case reports	Pooled cohort and observational studies.	Cohort, case series, case–noncase, and case-control studies	Case series and case reports	Case series and case reports
Heart-related complications								
Myocarditis	NR	2–5 per million mRNA vaccines	86.9%	3.8%	87.2%	79.73%	82.1%	76.6%
Myopericarditis	18.2 cases per million doses of vaccine	NR	NR	NR	NR	NR	NR	14.6%
Pericarditis	NR	NR	NR	NR	NR	1.66%	NR	2.3%
Stress-induced cardiomyopathy	NR	NR	NR	NR	NR	NR	NR	1.1%
Arrhythmia	NR	NR	NR	1.88%	NR	NR	NR	8.6%
Ischemic heart disease	NR	NR	NR	NR	NR	NR	NR	3.1%
Cardiological investigations								
Elevated troponin level.	NR	100%	100%	98.1%	NR	NR	98.6%	93.4%
Abnormal electrocardiograms.	NR	NR	68.5%	NR	88.4%	NR	88.5%	82%
Abnormal echocardiograms	NR	NR	NR	NR	27.9%	NR	NR	36.3%
Abnormal cardiac MRI	NR	NR	NR	NR	NR	NR	NR	68.6%
Abnormal findings in coronary artery imaging	NR	NR	NR	3.8%	NR	NR	NR	4.3%
Left ventricular ejection less than 50%	NR	NR	NR	41.5%	23.3%	NR	21.5%	36.3%
Cases improved								
Cases improved after the treatment	NR	NR	NR	NR	NR	99.67%	92.6%	96.9%

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