Mpox-associated myopericarditis

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Dear Editor

Since the emergence of the 2022 multi-state Mpox disease (formerly Monkeypox disease), there have been multiple reports of Mpox-associated endocarditis. Earlier, in the United States, the campaign for Smallpox vaccination from December 2002 to June 2003 resulted in cardiac complications with two confirmed cases and >50 probable myopericarditis cases. An additional study evaluated the incidence of smallpox-associated myocarditis in relation to ACAM2000 vaccine that was administered routinely to soldiers in March 2018. The observed cluster of cases was similar to that observed during the ACAM2000 clinical trial outcomes with rates of 5.23 (95% CI: 1.7-12.2) and 2.29 (95% CI: 0.3-8.3) per 1000 vaccinated individuals, respectively. A study compared the rate of myocarditis in relation to ACAM2000 and a control group showed a modest but non-significant increase in subclinical myopericarditis (adjusted OR, 1.3; unadjusted OR, 1.8). In a prospective study specifically looking for subclinical myopericarditis, there was no evidence of symptomatic or asymptomatic cases among recipients of the modified vaccinia Ankara (MVA).

In a recent case series, three patients had myocarditis in relation to mpox infection in France [1]. Additionally, two patients were reported from USA [2], one case in Canada [3] and one in Portugal [4]. These cases were treated supportively and had complete recovery [1–4] (Table 1). In a large case series, two (0.38%) of 528 patients required hospitalization due to mpox-associated myocarditis in a patient with and one without HIV infection [5]. A summary of mpox-associated myopericarditis is shown in Table 1. On the other hand, none of 156 admitted patients with complicated mpox had myocarditis. The case reports as well as data from smallpox vaccination campaigns show that myocarditis is a possible complication of mpox and that the majority were fully recovered. The associated risk factors leading to the development of myopericarditis and the predictive factors of progressive disease if any in such cases require further evaluation. We postulate that direct infection of the cardiac tissue by mpox virus may be a potential pathophysiological mechanism in addition to the possibility of an immunologic mechanism. Unfortunately, heart biopsies from infected patients are not available for investigating this hypothesis. Nevertheless, human-derived models such as heart-on-a-chip could serve as innovative systems for future research to address this question.

TABLE 1. A summary of reported cases of mpox-associated myopericarditis

Case number	Age	Gender	Country	Electrocardiogram (ECG)	High-sensitivity troponin	Echocardiography	Reference
1	21	Man	France	elevation of the ST segment in inferior leads	4040 pg/mL	normal	[1]
2	25	Man	France	ST segment in the inferior and anterior	700 pg/mL	decreased LV function	[1]
3	32	Man	France	normal	2035 pg/mL	normal	[1]
4	32	Man	USA	normal	165 ng/L	normal	[2]
5	37	Man	USA	T wave inversions in the inferior and anterolateral	not reported	normal	[2]
6	34	Man	Canada	sinus tachycardia with antero-lateral concave ST elevation (pericarditis)	211 ng/L	slightly reduced LV function	[3]
7	34	Man	Portugal	nonspecific ventricular repolarization abnormalities	6000 ng/L	normal	[4]

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