Myocarditis with Concurrent Monkeypox: More than an Association?

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Introduction

- Human monkeypox is an illness caused by the monkeypox virus. Even though first reported human infection in the 1970s, little is known about its non-cutaneous and other systemic manifestations[1].
- Here we describe a patient with confirmed monkeypox infection with serological, echocardiographic, and electrocardiographic evidence of acute myocarditis.

Objective

- To provide a detailed description of the medical history, presenting symptoms, and clinical course of the patient with myocarditis and monkeypox.
- To discuss the diagnostic tools, laboratory tests, and imaging techniques used to diagnose and monitor myocarditis.

Case presentation

- 39 years old man with a past medical history of syphilis infection, presented with a 2-day history of sore throat, fever, generalized itchy rash and pleuritic chest pain.
- The patient had a mild SARS-COV-2 infection two weeks before presentation with a complete clinical resolution.
- The patient is sexually active with multiple men without consistent use of barrier methods.
- At the emergency department, his vital signs were significant for fever, and sinus tachycardia. Physical examination showed tonsillar enlargement, erythema and exudates, bilateral cervical lymphadenopathy, and diffuse maculopapular lesions across the chest, and bilateral upper and lower extremities.
- Initially, patient was started on viral supportive treatment.
- Since the patient has high-risk sexual behavior, monkeypox was suspected and he was placed under contact and airborne isolation.
- Regarding troponemia A presumptive diagnosis of non-ischemic cardiomyopathy like acute myocarditis was made, but (LHC) was done to rule out coronary disease which revealed normal coronary arteries.
- Echo showed reduced ejection fraction, he started on guideline-directed medical treatment.
- When the orthopoxvirus was positive, the infectious team was consulted, and he was started on tecovirimat 600mg.

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Results

Tests	Results	Reference range
Hepatitis C Antibody	Not detected	-
Hepatitis Bs Antibody	positive	-
HIV-1 RNA PCR	Not detected	-
Syphilis IgG/IgM	reactive	-
N. Gonorrhoeae RNA	Not detected	-
C. trachomatis RNA	detected	-
troponin T peaking	4.539 ng/mL	<0.031 ng/mL
ESR	58 mm/hr	<20 mm/hr
CRP	7.383 mg/dL	<1 mg/dL
SARS-COV-2 PCR	not detected	-
Monkeypox PCR (CDC)	Detected	-
Throat culture for group-B streptococcus	positive	-
PRP	Non-reactive	-
Epstein-Barr virus IgM	negative	
Cytomegalovirus IgM	negative	
Transthoracic echocardiogram (Echo)	Ejection fraction (EF) of 40-45%.	

Fig. 1 lesions form in the mouth

Fig. 2 papule

Fig. 3 Pustules have crusted and scabbed over (end of the 2nd week.

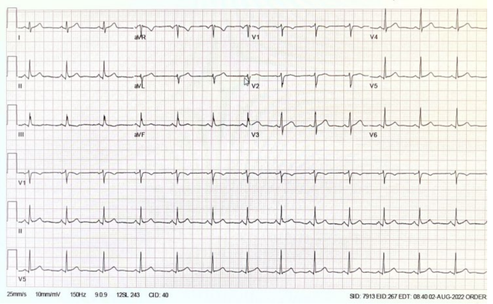

Fig. 4 (EKG) showed SR with PR depression and diffuse ST abnormalities

Discussion

- Clinicians must have a high suspicion of myocarditis in patients with monkeypox disease and any signs or symptoms of cardiac-related problem.
- In this patient, the resulting EKG changes, cardiomyopathy, troponemia and lack of obstructive coronary artery disease on LHC were consistent with acute viral myocarditis.
- It is unknown what the usual course of myocarditis is in patients with monkeypox, however this patient appeared to have a self-limited, subclinical, benign course.
- The majority of cases of monkeypox disease seen in Europe, Australia, and America are among males who have intercourse with other men, implying that transmission by intimate contact with infected skin lesions is the most likely method of transmission [2].
- A case was published about a 31-year-old male patient with a confirmed monkeypox infection who experienced acute myocarditis several days after the skin lesions appeared[3].
- El-Qushayri (2023) [4] reviewed the literature and found six cases of myocarditis, one case of pericarditis, one case of myopericarditis, and one case of atrial fibrillation in patient with Monkeypox infection.

Conclusion

- It's important for clinicians to maintain a high level of suspicion for non-cutaneous and other systemic manifestations of monkeypox disease, particularly in patients with high risk for monkeypox disease who exhibit symptoms or signs of cardiac dysfunction.

References

1. s. Š. E. M. N. Č. K. a. M. G. Marennikova, " Isolation and properties of the causal agent of a new variola-like disease (monkeypox) in man," *Bulletin of the World Health Organization,* vol. 46, no. 5, p. 599, 1972.
2. S. Š. E. M. N. Č. K. a. M. G. Marennikova, " Isolation and properties of the causal agent of a new variola-like disease (monkeypox) in man," Bulletin of the World Health Organization, vol. 46, no. 5, p. 599, 1972.
3. M. H. M. R. A. H. A. R. M. S. M. a. B. M. Islam, "Repositioning potentials of smallpox vaccines and antiviral agents in monkeypox outbreak: A rapid review on comparative benefits and risks," Health Scienc, p. e798, 2022.
4. A.T. A. a. M.-E. H. El-Qushayri, " Cardiovascular manifestations of monkeypox virus outbreak: An overview of the reported cases," Heart & Lung, vol. 59, pp. 67-72, 2023