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Monkeypox, Covid-19, and Heart in 2022

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ABSTRACT

A new outbreak of Monkeypox with novel cardiac presentations raises new concerns about the prevention, diagnosis, and management of this challenging healthcare system problem. Given the concurrent COVID-19 pandemic that also affects the cardiovascular system, this article highlights the interaction between these two infectious diseases and their impact on the heart.

Keywords: Covid-19; Cardiac; Heart; Monkeypox; Myocarditis; Pericarditis; Prevention; Vaccine

Abbreviations: MPX: Monkeypox, ACIP: Advisory Committee on Immunization Practices

Introduction

The Monkeypox (MPX) outbreak has occurred in 2022 while the global challenge of the COVID-19 pandemic that began in December 2019 has not been fully contained. MPX virus is a zoonotic linear, double-stranded DNA virus, a member of the Orthopoxvirus genus in the family Poxviridae [1]. MPX was first presented in the United States in 2003 after the importation of African rodents for the pet trade and led to 37 human cases [2]. Before 2022, cardiac involvement by the MPX virus had only been reported in samples from prairie dogs following experimental MPX infection [3]. However, novel data indicate that the MPX outbreak in 2022 has new clinical features consistent with cardiac involvement in the form of myocarditis as well as pericarditis in humans, either through direct infection or vaccination [4-8]. To date, various new vaccines against COVID-19 have been developed and released including Pfizer- BioNTech, Moderna, Johnson & Johnson, Oxford/AstraZeneca, Bharat Biotech, Sinopharm, Sinovac while the only available vaccines for protection against MPX are classic smallpox vaccines: JYNNEOS™ and ACAM2000®.

JYNNEOS™ is a live, replication-incompetent vaccine and ACAM2000® is a live, replication- competent vaccine [9]. Recommendations founded by Advisory Committee on Immunization Practices (ACIP) suggest that primary vaccination with ACAM2000® is contraindicated in individuals with ≥3 known major cardiac risk factors including hypertension, diabetes, hypercholesterolemia, heart disease at age ≤50 years in a first-degree relative, and smoking. However, in patients with known underlying heart diseases such as coronary artery disease or cardiomyopathy, both primary and revaccination with ACAM2000® are contraindicated [10]. On the other hand, several studies highlight the risk of post-vaccination myocarditis, pericarditis, or myopericarditis following mRNA COVID-19 and smallpox vaccines, particularly after vaccination with ACAM2000® [11-12]. In light of these findings, ACIP recommends a 4-week interval between MPX vaccination with JYNNEOS™ or ACAM2000® and prior to receiving the mRNA COVID-19 vaccines, primarily in adolescent and young adult males [10].

Conclusion

Although MPX and COVID-19 both originate from two different virus families, due to their co-occurrence in the same period and common cardiac involvement either through direct infection or vaccination, it is helpful for healthcare providers to be aware of the novel aspects of these new challenges to the health system and their potential interaction with each other in order to select and combine appropriate practical strategies in terms of prevention, diagnosis, and treatment of MPX and COVID-19 diseases to provide proper and quality care to patients.

Acknowledgment

None.

Conflict of Interest

All authors declare no conflict of interest.

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