



Immunization against Mpox infection is Coercive: A Timely Call



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Abstract

Mpox or monkeypox is a viral zoonotic disease caused by the monkeypox virus (MPXV). Recently, Mpox has been on the rise, and its multi-country spread has alarmed health officials throughout the world. Vaccination is essential for the prevention and management of mpox cases because there is currently no particular cure against the mpox virus. The current mpox epidemic calls for urgent action in the form of immunization. However, the smallpox vaccine and a newer vaccine named Modified Vaccinia Ankara (MVA) vaccine are effective against the disease. JYNNEOS vaccine is approved to be used in mpox cases. However, its efficacy and wide-scale production are still a matter of concern. The ACAM2000 vaccine, which also protects against both smallpox and mpox though it has severe adverse effects. Only an effective vaccination can drastically lower mpox infection and death rates. Safe and effective vaccines, along with their equitable distribution, are vital for global health. This article explores the importance of addressing this challenge. [*Bangladesh Journal of Infectious Diseases, June 2025;12(1):185-188*]

Keywords: Mpox; mpox vaccine; immunization; viral infection

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Introduction

Mpox, previously referred to as monkeypox, is a viral zoonotic disease caused by the monkeypox virus (MPXV). This virus is classified within the *Orthopoxvirus* genus of the Poxviridae family and is genetically related to the variola virus, which is responsible for smallpox¹⁻². MPXV is a double-stranded DNA virus that exhibits two distinct genetic clades: the Central African clade (Clade I) and the

West African clade (Clade II). Notably, the Central African clade is associated with more severe disease outcomes and higher transmissibility. Small mammals such as squirrels and monkeys are suspected to be the reservoir of the disease³⁻⁴. Recently, on 14th August 2024, the WHO declared mpox as a public health emergency of international concern. Further, mpox has been reported in Asia and Europe as well⁶. The high severity and ability to cross borders call urgent need for urgent action to

global public health and immediate vaccination to prevent another coronavirus outbreak.

Transmission and History of Mpox

Transmission of mpox primarily occurs through close contact with infected individuals or animals, which includes direct interaction with lesions, body fluids, respiratory droplets, or contaminated materials⁷⁻⁸. Human-to-human transmission is particularly prevalent in densely populated areas with limited healthcare access, leading to outbreaks that are often difficult to manage⁸. The clinical manifestations of mpox can range from mild to severe, presenting symptoms such as fever, intense headache, lymphadenopathy, back pain, myalgia, and profound weakness. A characteristic rash typically develops within a few days, starting on the face and spreading to other body parts, including the palms and soles. This rash progresses through various stages, from macules to papules, vesicles, pustules, and ultimately scabs⁹. Usually, clade I causes higher numbers of severe illnesses than clade II, with a case fatality ratio ten percent¹⁰. The first human case of mpox was reported in 1970 in the Democratic Republic of the Congo. Since the resurgence of mpox in 2022, there has been a notable global increase in cases, with over 100,000 reported worldwide as of September 2023. This surge includes significant outbreaks in non-endemic regions, raising concerns regarding the virus's potential for broader dissemination¹¹⁻¹². Factors contributing to this increase include changing environmental conditions, heightened human-animal interactions, and increased global travel⁷. The World Health Organization (WHO) declared the mpox outbreak a Public Health Emergency of International Concern (PHEIC) in July 2022, highlighting the urgent need for effective public health responses¹³. Recently, mpox has been identified in Pakistan and Europe as well.

Immunization against Mpox

Currently, there is no specific treatment for mpox; management focuses on alleviating symptoms and preventing complications. The smallpox vaccine offers some cross-protection against mpox, and newer vaccines, such as the Modified Vaccinia Ankara (MVA) vaccine, have been developed and deployed in response to recent outbreaks^{4,8}. Public health measures, including isolation of cases, contact tracing, and community education, are critical for controlling the spread of the disease⁹. As mpox continues to challenge global health security, ongoing surveillance, research, and vaccine distribution remain essential to mitigate its impact¹.

Given the severity of the ongoing mpox outbreak, there is an urgent need for a highly effective vaccine to combat this potentially deadly virus and prevent further escalation of the epidemic. Vaccination remains the most effective method for controlling viral infections and protecting vulnerable populations^{14,15}. The existing smallpox vaccine, which offers some cross-protection against mpox, is currently being utilized in response to the outbreaks. However, this vaccine has limitations, including its availability and potential side effects, particularly in immunocompromised individuals¹⁶. The JYNNEOS vaccine (also known as Imvamune or Imvanex), initially developed for smallpox, has been approved for use against mpox. Clinical trials have demonstrated that JYNNEOS is effective in preventing mpox infection, with an estimated efficacy of approximately 85% against severe disease^{14,17}. However, the vaccine's efficacy in preventing mild or asymptomatic infections is still under investigation¹⁸. The two-dose regimen of JYNNEOS has shown promise in reducing the spread of the virus, but challenges remain in scaling up production and ensuring equitable access to the vaccine, particularly in low- and middle-income countries¹⁹. Another potential candidate is the ACAM2000 vaccine, which also protects against both smallpox and mpox. While ACAM2000 is effective, it carries a higher risk of adverse effects, particularly in individuals with certain preexisting health conditions. Consequently, its use is generally limited to specific populations^{14,20}. Research is ongoing to develop new vaccines specifically targeting mpox, with several candidates in the pipeline. These next-generation vaccines aim to provide broader protection with fewer side effects, making them suitable for widespread use²¹.

Discussion

The global deployment of an effective and safe mpox vaccine is crucial to curbing the spread of the disease and preventing future outbreaks. The lessons learned from the COVID-19 pandemic underscore the importance of rapid vaccine development and distribution to mitigate the impact of emerging infectious diseases²². Given the increasing number of cases and the strain on healthcare systems worldwide, particularly in resource-limited settings, the development and distribution of a targeted mpox vaccine are of paramount importance. Such a vaccine would not only protect individuals from infection but also alleviate the burden on public health infrastructure, which is already under pressure from other ongoing health challenges²³. As research progresses, the hope is that an effective mpox

vaccine will become a key tool in the global fight against this emerging threat.

Conclusion

To conclude, the public health sector of the entire world is still suffering from the devastating coronavirus outbreak. This new upsurge will put more strain on the public health sector. So, the development and dissemination of an effective and safe vaccine for mpox infection is an urgent need for the people of Bangladesh, along with the entire population of the world.

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Conflict of Interest

The authors declare no conflict of interest.

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Authors' contributions

Iftekhar Ahmed: Conceptualization; writing—original draft; review and editing; supervision. Rayhan Ahamed: Conceptualization; writing—original draft. Lazima F. Bari: Writing—original draft. Md. Yusuf Shanto: Writing—original draft. Md. Rafat Tahsin: Writing—original draft. All authors have read and approved the final version of the manuscript.

Transparency Statement

The lead author Iftekhar Ahmed affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

Data Availability

Not Applicable

Ethics Approval and Consent to Participate

Not Applicable

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References

1. Alakunle EF, Okeke MI. Monkeypox virus: a neglected zoonotic pathogen spreads globally. *Nat Rev Microbiol*. 2022;20(9):507-508.
2. Bunge EM, Hoet B, Chen L, et al. The changing epidemiology of human monkeypox-A potential threat? A systematic review. *PLoS Negl Trop Dis*. 2022;16(2):e0010141
3. Ekpunobi N, Akinsuyi O, Ariri T, Ogunmola T. The Reemergence of Monkeypox in Nigeria. *Challenges*. 2023;14(2):22.
4. Goyal L, Ajmera K, Pandit R, Pandit T. Prevention and Treatment of Monkeypox: A Step-by-Step Guide for Healthcare Professionals and General Population. *Cureus*. 2022;14(8):e28230.
5. Islam MR, Asaduzzaman M, Shahriar M, Bhuiyan MA. The spreading of monkeypox in nonendemic countries has created panic across the world: Could it be another threat? *J Med Virol*. 2023;95(1):e27919.
6. Najimudeen M, Chen HWJ, Jamaluddin NA, Myint MH, Marzo RR. Monkeypox in Pregnancy: Susceptibility, Maternal and Fetal Outcomes, and One Health Concept. *Int J MCH AIDS*. 2022;11(2):e594.
7. Philpott D, Hughes CM, Alroy KA, Kerins JL, Pavlick J, Asbel et al. Epidemiologic and Clinical Characteristics of Monkeypox Cases - United States, May 17-July 22, 2022. *MMWR Morb Mortal Wkly Rep*. 2022;71(32):1018-1022.
8. Saxena SK, Ansari S, Maurya VK, Kumar S, Jain A, Paweska JT, et al. Re-emerging human monkeypox: A major public-health debacle. *J Med Virol*. 2023;95(1):e27902.
9. Shareef FI, Abdulla ML, Ibrahim AE, Subbaram K. Resurgence of Monkeypox: Transmission, Clinical Features with Emphasis on Countermeasures and Treatment. *Pharmacophore*. 2022;13(6):42-9.
10. Vaughan A, Aarons E, Astbury J, Balasegaram S, Beadsworth M, Beck CR, Chand M, et al. Two cases of monkeypox imported to the United Kingdom, September 2018. *Euro Surveill*. 2018;23(38):1800509.
11. Berry MT, Khan SR, Schlub TE, Notaras A, Kunasekaran M, Grulich AE et al. Predicting vaccine effectiveness for mpox. *Nat Commun*. 2024;15(1):3856
12. Chandran, D., Nandanagopal, V., Gopan, M., Megha, K., Sankar, C., Aslam, M et al. Major advances in monkeypox vaccine research and development – an update. *J Pure App Micro*. 2022;16(suppl 1):3083-3095.
13. Ghazy RM, Elrewany E, Gebreal A, ElMakhzangy R, Fadl N, Elbanna EH, et al. Systematic Review on the Efficacy, Effectiveness, Safety, and Immunogenicity of Monkeypox Vaccine. *Vaccines (Basel)*. 2023;11(11):1708.
14. Islam MR, Haque MA, Ahamed B, Tanbir M, Khan MR, Eqbal S et al. Assessment of vaccine perception and vaccination intention of Mpox infection among the adult males in Bangladesh: A cross-sectional study findings. *PLoS One*. 2023;18(6):e0286322.
15. Khan G, Perveen N. The 2022 monkeypox outbreak 1 year on: The 5 Ws. *Rev Med Virol*. 2024;34(1):e2489.
16. León-Figueroa DA, Barboza JJ, Valladares-Garrido MJ, Sah R, Rodriguez-Morales AJ. Prevalence of intentions to receive monkeypox vaccine. A systematic review and meta-analysis. *BMC Public Health*. 2024;24(1):35

17. Meo SA, Al-Masri AA, Klonoff DC, Alshahrani AN, Al-Khlaiwi T. Comparison of Biological, Pharmacological Characteristics, Indications, Contraindications and Adverse Effects of JYNNEOS and ACAM2000 Monkeypox Vaccines. *Vaccines (Basel)*. 2022;10(11):1971.
18. Moawad MH, Taha AM, Nguyen D, Ali M, Mohammed YA, Moawad WAE et al. Attitudes towards Receiving Monkeypox Vaccination: A Systematic Review and Meta-Analysis. *Vaccines (Basel)*. 2023;11(12):1840.
19. Najimudeen M, Chen HWJ, Jamaluddin NA, Myint MH, Marzo RR. Monkeypox in Pregnancy: Susceptibility, Maternal and Fetal Outcomes, and One Health Concept. *Int J MCH AIDS*. 2022;11(2):e594.
20. Sharif N, Sharif N, Alzahrani KJ, Halawani IF, Alzahrani FM, Diez IT et al. Molecular epidemiology, transmission and clinical features of 2022-mpox outbreak: A systematic review. *Health Sci Rep*. 2023;6(10):e1603.
21. Speiser LJ, Wonnepaerhown AM, Blair J, Shah A, Patel DR, McCullough AE, et al. A Case of Sustained Viral Shedding of Mpox with Ocular Involvement Resulting in Vision Loss. *Open Forum Infect Dis*. 2023;11(1):ofad632.
22. Centers for Disease Control and Prevention. About Mpox [Internet]. Updated 2024 Aug 06 [cited 2024 Oct 03]. Available from: <https://www.cdc.gov/mpox/about/index.html>
23. World Health Organization. WHO Director-General declares mpox outbreak a public health emergency of international concern [Internet]. Updated 2024 Aug 14 [cited 2024 Oct 03]. Available from: <https://www.who.int/news/item/14-08-2024-who-director-general-declares-mpox-outbreak-a-public-health-emergency-of-international-concern>