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SEXUAL HEALTH

Case study: breakthrough mpox infection in Aotearoa New Zealand and Australia after completed two-dose course of subcutaneous modified vaccinia Ankara (MVA-BN) vaccines

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ABSTRACT

Background. In August 2022, in response to a global mpox outbreak, the World Health Organization recommended the Vaccinia vaccination for at-risk people. **Methods.** Case study. **Results.** We describe a case of a HIV-negative bisexual man who developed a symptomatic mpox infection 13 weeks after completing a two-dose course of subcutaneous third-generation modified vaccinia Ankara vaccines. The case likely acquired his mpox infection in the USA; was diagnosed in Aotearoa, New Zealand; and was followed-up in Australia, as he was actively travelling during his infection. **Conclusions.** This case highlights the importance of maintaining clinical suspicion for mpox in people who present with consistent symptoms, even if they are fully vaccinated. Also, as he travelled around Aotearoa, New Zealand, and Australia during his infection, this case highlights how public health authorities and clinicians can cooperate across jurisdictional boundaries to support cases and minimise the risk of onward transmission.

Keywords: disease outbreaks, homosexuality, imvamune, male, monkeypox, orthopoxvirus, smallpox, tecovirimat, vaccination, vaccinia.

Introduction

In mid-2022, coinciding with LGBTQ+ Pride season in the northern hemisphere, a new outbreak of mpox virus (previously known as Monkeypox) emerged among gay, bisexual and other men who have sex with men (GBMSM). Mpox virus is an orthopox virus, which is related to the smallpox virus. The first cases in this outbreak were described in May 2022 in the UK,[1] and subsequently this outbreak spread to GBMSM in major cities around the world. Case numbers peaked in mid-August 2022 at 1000 reported daily cases worldwide.[2] In response to this outbreak, on 24 August 2022 the World Health Organization recommended vaccination for GBMSM with multiple sexual partners using a repurposed vaccinia vaccine, which was developed to manage outbreaks of smallpox.[3] In most jurisdictions, these recommendations were implemented using a two-dose course of third-generation modified vaccinia Ankara vaccines produced by Bavarian Nordic (MVA-BN, branded Jynneos® or Imvanex®).

Recent papers have described mpox infections in people who have received vaccinia vaccines, including in people who received second-generation vaccines in childhood many years previously,[4,5] people who had received only one dose of MVA-BN vaccine prior to exposure,[5,6] people who had received MVA-BN vaccination as post-exposure prophylaxis after mpox exposure,[7,8] and people who had been fully immunised with a two-dose course of MVA-BN. This case was the first confirmed case of breakthrough mpox infection in Aotearoa New Zealand (AoNZ) and Australia, occurring after full two-dose vaccination with MVA-BN.

Case details

This is a case of a HIV-negative bisexual man from the USA, aged in his mid-20s, using HIV pre-exposure prophylaxis, who was diagnosed with mpox at the end of December 2022

while travelling through AoNZ and Australia, accompanied by his regular male sexual partner. He and his partner had both received two subcutaneous doses of MVA-BN vaccine with 43 days between doses. In addition to his regular male partner, the case had several casual male partners around the time of likely mpox exposure but no female partners. He did not consistently use condoms.

Prior to their departure to AoNZ and Australia, they both underwent asymptomatic screening for HIV, syphilis, chlamydia and gonorrhoea, and both tested positive for gonorrhoea on pharyngeal swabs. These results became known after their departure from the USA. After unsuccessfully seeking medical care in Auckland, they both sought gonorrhoea treatment from a general practitioner (GP) in Queenstown, AoNZ. During this consult, the case mentioned that he had painless penile lesions, which had been present for 1 week. He had no associated systemic symptoms or other anogenital symptoms. The lesions initially appeared 13 weeks after his second MVA-BN vaccination; hence, the case thought he was protected and had not considered that the lesions could be due to mpox. The Queenstown GP diagnosed mpox based on a clinical examination that showed a cluster (possibly 15) of penile lesions, which were confirmed by nucleic acid amplification testing for mpox DNA on a swab of the lesions. The GP also noted the presence of inguinal lymphadenopathy. The patient was prescribed tecovirimat 600 mg bd for 14 days to decrease viral shedding and transmission risk to others, particularly as he was travelling. The patient notified all his sexual contacts of the mpox diagnosis, who were all located in the USA. In collaboration with the local public health unit, he was advised to take strict precautions to reduce transmission risk, including social distancing (or wearing a mask when not possible), keeping his lesions covered, and practicing regular hand hygiene. After travelling to Australia, the local public health unit referred him for medical review in Sydney. On review, on day 14 following symptom onset, he remained systemically well and afebrile, but he was noted to have three moist penile ulcers, which swabbed positive for mpox DNA but negative for varicella zoster DNA, herpes simplex DNA, and *Treponema pallidum* DNA. The clinical appearance of the ulcers was consistent with a secondary bacterial infection, and hence, a course of oral cephalexin 500 mg qid was commenced. Due to the timing of the clinic visit on a Friday evening, a culture swab was not able to be processed. During a telephone consultation 4 days later (day 18), by which time he had travelled to Melbourne, the case reported that the penile ulcers had improved significantly since starting the antibiotics, having dried and scabbed. He subsequently made a full recovery.

His regular male partner did not develop symptoms of mpox.

Conclusion

This report describes a case of symptomatic mpox infection in a young male HIV-negative bisexual patient who completed a full course of MVA-BN vaccination 13 weeks prior to his mpox symptom onset. To the best of our knowledge, this was the first such case in AoNZ and Australia. This case highlights the importance of maintaining clinical suspicion for mpox infection in individuals with epidemiological risk who present with mpox-consistent symptoms, even when these individuals are fully vaccinated against mpox. Also, as he travelled through AoNZ and Australia during his infection, this case highlights how public health authorities and clinicians can cooperate across jurisdictional boundaries to support cases and minimise the risk of onward transmission.

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Consent. Written permission was obtained from the case at the time of clinical review in Sydney and confirmed again in writing after the case reviewed the finalised case report prior to publication.

Data availability. The data that support this study cannot be publicly shared due to ethical or privacy reasons and may be shared upon reasonable request to the corresponding author if appropriate.

Conflicts of interest. VJC is an Associate Editor of *Sexual Health*. To mitigate this potential conflict of interest they were blinded from the review process. The other authors have no conflicts of interest to declare.

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