Mpox in the New York Metropolitan area, Summer 2022

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Abstract

Early in the 2022 Mpox (MPX) global outbreak, caseloads in the New York Metropolitan area climbed rapidly before other US urban areas. This case series summarizes the authors' clinical experience detecting and treating MPX, during a quickly evolving outbreak. Clinical outcomes were recorded with a focus on varied clinical presentation and outcomes such as complications and response to experimental tecovirimat therapy. A focal or multifocal rash was the most common presenting symptom in 91% of patients. Almost two thirds (62%) of patients had anogenital involvement. Proctitis was one of the most painful presentations with 75% requiring antiviral treatment and 3 patients needing hospitalization for pain management. Most patients responded promptly to antiviral treatment with tecovirimat. Five out of 10 patients treated with tecovirimat reported symptom resolution within 48 – 72 hours of therapy and another 3 saw resolution within first 96 hours. Two patients had poor response to tecovirimat. This series includes the only reported case of an HIV positive, immunocompetent patient who experienced recurrent anal ulcers due to Mpox and required a second course of tecovirimat. Other unique presentations included urethritis, abscess formation and MPX infection post-vaccination. Control of this current Mpox outbreak was possible due to timely diagnosis and the availability of both a licensed vaccine and an investigational drug.

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Running title: Mpox in New York

Abstract: Early in the 2022 Mpox (MPX) global outbreak, caseloads in the New York Metropolitan area climbed rapidly before other US urban areas. This case series summarizes the authors' clinical experience detecting and treating MPX, during a quickly evolving outbreak. Clinical outcomes were recorded with a focus on varied clinical presentation and outcomes such as complications and response to experimental tecovirimat therapy. A focal or multifocal rash was the most common presenting symptom in 91% of patients. Almost two thirds (62%) of patients had anogenital involvement. Proctitis was one of the most painful presentations with 75% requiring antiviral treatment and 3 patients needing hospitalization for pain management. Most patients responded promptly to antiviral treatment with tecovirimat. Five out of 10 patients treated with tecovirimat reported symptom resolution within 48 – 72 hours of therapy and another 3 saw resolution within first 96 hours. Two patients had poor response to tecovirimat. This series includes the only reported case of an HIV positive, immunocompetent patient who experienced recurrent anal ulcers due to Mpox and required a second course of tecovirimat. Other unique presentations included urethritis, abscess formation and MPX infection post-vaccination. Control of this current Mpox outbreak was possible due to timely diagnosis and the availability of both a licensed vaccine and an investigational drug.

Keywords: Mpox, Monkeypox, Orthopox, outbreak, tecovirimat, Jynneos

Statements

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Monkeypox is a zoonotic disease caused by a double-stranded DNA virus known as Family *Poxviridae* , subfamily *Chordopoxvirinae* , genus *Orthopoxvirus* , species *Monkeypox*virus.[1,2] Recently, the World Health Organisation responded to concerns of social stigma and discrimination by recommending to change the name of the infection to Mpox.[3] Mpox (MPX) circulated in West and Central Africa with small, short-lived outbreaks outside of Africa.[4,5] Starting in May of 2022, a global outbreak of MPX was reported, which grew to over 85,765 cases in 110 countries, as of February 13, 2023.[6,7,8] This report summarizes here the authors' MPX clinical experience at an academic medical center serving the New York Metropolitan area, including the Hudson Valley and New York City.

The first case of MPX was seen in at the institution in June 2022 in a patient with recent travel to a large social event for gay and bisexual men in Florida. He presented with multiple vesicular lesions and scabs in the genital area, extremities, and trunk along with inguinal lymphadenopathy, fever, chills and fatigue. Since this initial case, 23 other patients were diagnosed with MPX; demographic and clinical description are described in Table 1. All patients with suspicious dermatologic findings had MPX PCR done on dry swabs of skin lesions sent to the New York State or commercial reference laboratory.

Symptoms of MPX described by the patients included fatigue, myalgia, fever, chills, body aches, headaches, skin rashes, genital rashes (Figure 1, panels A-H) and constipation which correlate with those frequently described in the literature.[9] Less common presentations included rectal abscess (2), peritonsillar abscess (1), acute urethritis (2) and proctitis (8). The abscesses were treated with antibiotics since they were suspected to be due to bacterial superinfection. Proctitis was an especially painful complication, observed in 8 of the

24 patients. All patients with proctitis had constipation, 4 had hematochezia, and 2 had urinary retention. Three of the 8 patients with proctitis required hospitalization for pain management.

All patients who presented with MPX were evaluated for tecovirimat treatment through the expanded access investigational new drug protocol managed by the Center for Disease Control (CDC). Ten patients met the CDC inclusion criteria for therapy.[10,11] and received fourteen-day courses of tecovirimat. Clinical response to tecovirimat was observed with resolution of symptoms in 5 patients within 48 – 72 hours of therapy and in another 3 within 96 hours. No patients noted any side effects attributable to tecovirimat.

One HIV positive patient with a recent absolute CD4 count of 611 cells/dL and a suppressed HIV viral load showed a very slow response to his initial course of tecovirimat. Within 4 days of ending therapy, the patient developed new painful anal ulcers that were Herpes Simplex Virus 1/2 (HSV) PCR negative and MPXV PCR positive. He failed a 5-day course of valacyclovir and thus was given a second 14-day course of tecovirimat with complete resolution of his recurrent symptoms. Four weeks after the last dose of tecovirimat, this patient underwent sigmoidoscopy, which did not show any residual ulcers or signs of anal strictures. Another patient who had diabetes and was HIV negative presented with very tender, purulent buttock nodules (Figure 1, panels F-H) and proctitis. He was hospitalized for pain management. By the time he started tecovirimat, he had had 10 days of enuresis and 4 days of urinary retention. This patient's urethritis resolved with two days of tecovirimat and he passed stool after three days of therapy.

Five patients developed symptoms of MPX and tested positive by PCR after their initial dose of JYNNEOS (Smallpox and Monkeypox Vaccine, Live, Non-replicating). One patient presented with rash the day of vaccination. Two patients, who had known close contact with MPX developed rash within a day of vaccination. Two more patients reported MPX rash onset 4 and 5 days after vaccination, respectively. None of the patients who developed rash after vaccination had severe disease.

Mpox involving mucosal surfaces can cause significant morbidity by eliciting painful mucositis of the pharynx, urethra, and anus. This can lead to urinary retention and severe constipation. In our cohort, we noted 11 patients with mucositis, 2 of whom presented with mucositis prior to rash onset. In addition, we noted significant purulent lesions involving the skin or mucosal surfaces that require antiviral therapy to hasten recovery without empiric antibiotics.

Mpox point mutations have been identified by the CDC during this Mpox outbreak but the clinical significance has not been elucidated yet.[12,13] In our case series, a good response with resolution of symptoms on tecovirimat in all but 2 patients were noted. As described above, 1 patient had rebound anal ulcers a few days after cessation of tecovirimat and the second patient had little to no response to tecovirimat. It is unknown at this time if the recurrent infection was due to a resistant strain or failure of the immune system to clear the infection.

Five patients developed Mpox after the initial dose of JYNNEOS. Since 2 of the 5 developed rash within a day and the other 2 within 5 days, it is likely that these patients were harboring MPX at the time of vaccination given that the average incubation period is 7 days.[14] Similarly, other studies reported that 4-10% of cases developed MPX despite post-exposure vaccination with an average occurrence of 5 days post immunization which supports the theory that protective immunity has not developed during that time span.[15,16]

New York City experienced a rapid, high-impact outbreak of MPX which overflowed into the local counties, taxing medical resources throughout the New York Metropolitan area. Control of this current Mpox outbreak was possible due to timely onboarding of accurate diagnostics, availability of an investigational drug, and mass vaccination.[17] This case series sheds light on the MPX's characteristic clinical features of presentation, response to treatment, and clinical outcomes. Uncommon presentations included severe urethritis, suppurative ulcerations, abscess formation, and MPX infection after post-exposure vaccination. Slow response to tecovirimat or recurrence of symptoms was not uncommon.

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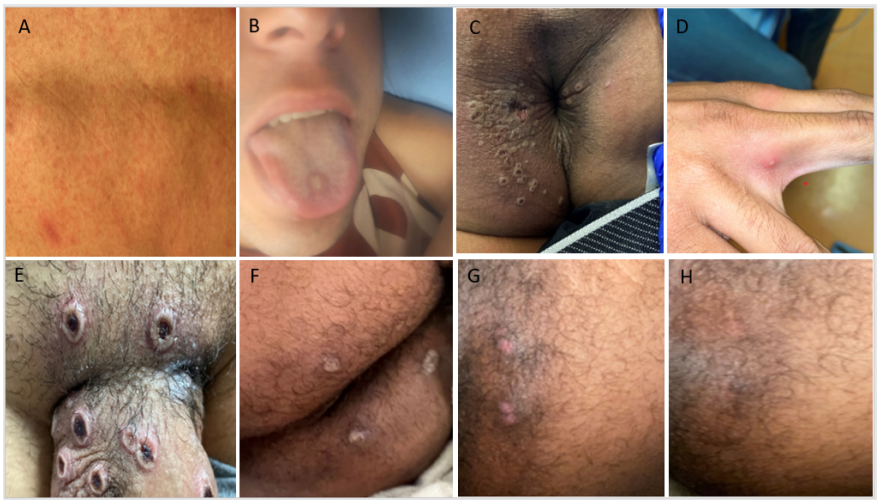

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