Ocular MPOX: Manifestations and Treatment

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Introduction

- MPOX (monkeypox) manifests with lesions to the skin and mucous membranes
- The 2022 outbreak in the US was characterized by anogenital lesions primarily in the MSM population[1]
- Conjunctivitis and blepharitis occurred in up to 30% of unvaccinated patients[2]
- Corneal ulceration and keratitis observed in about 4% of unvaccinated patients[2]
- Presentation and prognosis vastly different in immunocompetent vs immunocompromised
- Objective is to raise awareness of rare, but serious presentations for early diagnosis and treatment

Discussion

- Ocular MPOX in an immunocompetent patient was found in only one similar case study[3]
- Most severe MPOX cases with ocular manifestations were in patients living with HIV and CD4 <200 cells/μL[4]
- Delayed onset of symptoms may be due to ocular immune privilege, a mechanism which suppresses the immune response of the eye in immunocompetent individuals[5,] remarkably like ocular Ebola cases[6] despite vast differences between viruses
- Both IV and PO tecovirimat are effective, however, response can be weaker in immunocompromised and in more severe systemic disease

Case A

- 31-year-old cisgender male, HIV negative, unvaccinated for MPOX presented with ocular pain, erythema, vision loss, and clouding to left eye for 8 weeks
- Initially treated for corneal ulceration, HSV iridocyclitis, and *S. hemolyticus* superinfection with trifluridine and other topical antiviral and antibacterial agents without improvement of symptoms
- Patient denied current body lesions, but had recovered from MPOX without ocular infection 1-2 weeks prior to onset of eye symptoms
- Patient started on 600mg tecovirimat PO every 8 hours with meals, ocular topicals continued per ophthalmology
- Ocular pain and size of corneal ulceration improved within 1 week of tecovirimat treatment
- Tecovirimat was continued for 5 weeks total with resolution of symptoms except for residual vision loss due to corneal scarring

Case B

- 29-year-old male with advanced HIV infection (CD4 12 cells/μL and viral load (VL) 34,200 copies/mL), and poor antiretroviral treatment adherence on Biktarvy, presented with a rash consistent with MPOX
- On day ten of illness, he developed conjunctival erythema. A skin swab was positive for orthopoxvirus (OPXV) by PCR. Oral tecovirimat and trifluridine eye drops were started, however, due to progressive left eye pain and blurred vision, he was hospitalized
- On admission to Hospital A, he was found to have a corneal ulcer, where he was treated with intravenous tecovirimat and topical trifluridine eye drops. He experienced improvement and decreased ulcer size by day five, and he was discharged on oral tecovirimat and topical trifluridine to complete a 14-day course
- Over the next four weeks, he developed new facial lesions, worsening visual loss and increased tearing and pain and presented to Hospital B, where he was noted to have left eye conjunctivitis, keratitis, and a conjunctival ulcer. A conjunctival swab was positive for OPXV, and biopsy showed necro-ulcerative conjunctivitis with extensive intralesional orthopoxviral antigen detected by immunohistochemistry. A new skin lesion was also positive for OPXV. By the end of the five-week hospitalization, he had received 59 days of IV and oral tecovirimat and three weekly doses of IV cidofovir, with resolution of cutaneous lesions and improvement in the left eye conjunctivitis, but with persistent vision loss. His anti-retroviral regimen was also optimized during his hospital course leading to a CD4 count 30 cells/μL and a HIV VL of 30 copies/mL
- Three days following discharge he presented to Hospital C for myalgia and progressive rash for which IV tecovirimat was started, and he received another 14-day course with resolution of symptoms. As of this writing, he remains stable with corneal scarring limiting his vision in the involved eye

Conclusions

- OMPOX should be ruled out with conjunctival PCR in cases of suspected ocular HSV that do not respond to trifluridine and valacyclovir
- OMPOX should be considered as a potential diagnosis even in recovered MPOX patients because of ocular immune privilege
- Tecovirimat continued until symptoms resolve (up to 90 days) is an effective treatment for ocular MPOX , even with past treatment history with tecovirimat
  - Immunocompromise increases likelihood of requiring a prolonged course. Patients who cannot tolerate oral therapy should receive IV to increase absorption[8]
- Topical trifluridine is a recommended treatment option[8], but may result in ocular toxicity if used for >21 days[9]
- Delays in diagnosis can lead to permanent vision loss
- In profound immunocompromise, disease may not fully resolve until immune reconstitution has taken place
- Management of OMPOX is interdisciplinary and requires open communication with all stakeholders

References

1. Zong Y, Kamoi K, Zhang J, Yang M, Ohno-Matsui K. Mpox (Monkeypox) and the eye: Ocular manifestation, diagnosis, treatment and vaccination. *Viruses* 2023; 15(3):616. doi:10.3390/v15030616.
2. Abdelaal A, Serhan HA, Mahmoud MA, Rodriguez-Morales AJ, Sah R. Ophthalmic manifestations of monkeypox virus. *Eye* 2023; 37:383-385. doi: 10.1038/s41433-022-02195-z.
3. Rai RS, Kahan E, Hirsch B, Udell I, Hymowitz M. Ocular pox lesions in a male patient with monkeypox treated with tecovirimat. *JAMA Ophthalmol*. Published online November 3, 2022. doi:10.1001/jamaophthalmol.2022.4568
4. Cash-Goldwasser S, Labuda SM, McCormick DW, et al. Ocular monkeypox — United States, July–September 2022. *MMWR Morb Mortal Wkly Rep*. 2022;71(42):1343-1347. doi:10.15585/mmwr.mm7142e1
5. Streilein JW. Ocular immune privilege: the eye takes a dim but practical view of immunity and inflammation. *Journal of Leukocyte Biology*. 2003; 74(2): 179-185. doi: 10.1189/jlb.1102574
6. Berry DE, Li AL, Yeh S, Shantha JG. Ocular complications in Ebola virus disease survivors: the importance of continuing care in West Africa. *Expert Rev Ophthalmol*. 2019; 14(3): 179-185. doi: 10.1080%2F17469899.2019.1623025
8. Rao AK, Schrodt CA, Minhaj FS, et.al. Interim Clinical Treatment Considerations for Severe Manifestations of MPOX – United States,February 2023. *MMWR* 2023; 72 (9): 232-243
9. Pfizer. Viroptic ophthalmic solution, 1% sterile US physician prescribing information. 2018. Retrieved 22 April 2023 from https://labeling.pfizer.com/ShowLabeling.aspx?id=700