Otolaryngologic Manifestations Among MPOX Patients: A Systematic Review and Meta-Analysis

Tiana M. Saak, BA[1*]; Jaffer Shah, BS[2*]; Angel N. Desai, MD, MPH[3,4]; David A. Gudis, MD[5]; Huzaifa Ahmad Cheema, MD[6]; Mohamed Abuelazm, MD[7]; Diego Preciado, MD, PhD[8]; Jason Zucker, MD[9]; Jonathan B. Overdevest, MD, PhD[5]

[1]Columbia University Vagelos College of Physicians and Surgeons, New York, New York
[2]Weill Cornell Medicine, New York, New York
[3]Division of Infectious Diseases, University of California Davis Medical Center, Sacramento, California
[4]Associate Editor, JAMA Network Open, Chicago, Illinois
[5]Department of Otolaryngology–Head & Neck Surgery, Columbia University Irving Medical Center, NewYork-Presbyterian Hospital, New York, New York
[6]Department of Medicine, King Edward Medical University, Lahore, Pakistan
[7]Otolaryngology Department, Tanta University, Tanta, Egypt
[8]Department of Otolaryngology–Head & Neck Surgery, George Washington University, Children's National Hospital, Washington, DC
[9]Division of Infectious Disease, Department of Medicine, Vagelos College of Physicians and Surgeons, Columbia University, New York, New York
*these authors contributed equally

COLUMBIA
OTOLARYNGOLOGY
HEAD AND NECK SURGERY

Weill Cornell Medicine

How do the predominant otolaryngologic clinical features of MPOX vary based on outbreak and geographical location?

INTRODUCTION

MPOX presents with a variety of otolaryngologic symptoms that have been recognized as diagnostically important in the clinical setting. The objective of our study is to identify the otolaryngologic manifestations of MPOX across previous and current outbreaks and among endemic and non-endemic regions to aid in the recognition of the infection in an otolaryngology setting, as these variations have yet to be elucidated.

METHODS

Systematic review of published literature reporting data on laboratory-confirmed MPOX patients with otolaryngologic symptoms through August 2022. Data were extracted by two authors independently. A meta-analysis for the prevalence rate of otorhinolaryngologic symptoms was performed using MetaXL software (version 5.3) under a random-effects model. Main outcome measurements compared the otolaryngologic presentation of MPOX in i) past vs. current outbreaks and ii) endemic vs. non-endemic regions.

RESULTS

Thirty-eight studies with 5952 patients were included. The four most prevalent manifestations were headache at 31% (95% CI [0.16-0.49], I^2=99%), sore throat at 22% (95% CI [0.09-0.37], I^2=99%), cough at 16% CI [0.05-0.30], I^2=99%), and cervical lymphadenopathy at 10% (95% CI [0.01-0.26], I^2=100%). Otolaryngologic features with higher prevalence in previous outbreaks compared to the 2022 outbreak include headache, cough, sore throat, cervical lymphadenopathy, oral ulcers, oral exanthem, and dysphagia. Features that were more prevalent in endemic areas versus non-endemic areas include cough, tonsillar signs, and cervical lymphadenopathy, while headache was the only feature more prevalent in non-endemic areas.

CONCLUSIONS

Four symptoms – headache, sore throat, cough, and cervical lymphadenopathy – were found to be the most prevalent otolaryngologic features of MPOX. Otolaryngologic manifestations of MPOX were more pronounced in prior outbreaks and in endemic areas as compared to the 2022 outbreak and in non-endemic areas. These findings may aid in MPOX recognition in the otolaryngology clinical setting.

Results

Figure 1. Most prevalent pooled otolaryngologic symptoms

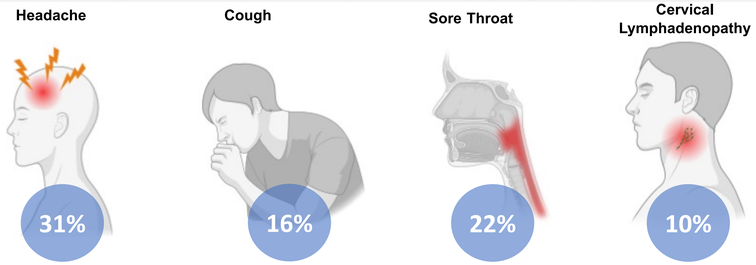


Table 1. Prevalence of otolaryngologic symptoms across **outbreak** and **region**

	Pooled	Prior Outbreaks	2022 Outbreak	Endemic Regions	Non-Endemic Regions
Headache	**31% (95% CI [0.16-0.49], I^2=99%)**	**37% (95% CI [0.11-0.66], I^2=100%)**	23% (95% CI [0.14-0.34], I^2=96%)	24% (95% CI [0.01-0.57], I^2=96%)	**36% (95% CI [0.24-0.47], I^2=96%)**
Cough	**16% (95% CI [0.05-0.30], I^2=99%)**	**33% (95% CI [0.21-0.47], I^2=98%)**	0% (95% CI [0.00-0.00], I^2=0%)	**27% (95% CI 0.014-0.41], I^2=99%)**	5% (95% CI [0.01-0.11], I^2=95%)
Cervical Lymphadenopathy	**10% (95% CI [0.01-0.26], I^2=100%)**	**15% (95% CI [0.00-0.428], I^2=100%)**	4% (95% CI [0.00-0.11], I^2=97%)	**19% (95% CI [0.00-0.48], I^2=100%)**	6% (95% CI [0.01-0.14], I^2=97%)
Sore Throat	**22% (95% CI [0.09-0.37], I^2=99%)**	**27% (95% CI [0.07-0.53], I^2=99%)**	12% (95% CI [0.02-0.27], I^2=98%)	21% (95% CI [0.02-0.50], I^2=100%)	20% (95% CI [0.07-0.37], I^2=98%)
Odynophagia	**0% (95% CI [0.00-0.00], I^2=0%)**	0%	0%	2% (95% CI [0.00-0.13], I^2=99%)	0% (95% CI [0.00-0.00], I^2=79%)
Dysphagia	**2% (95% CI [0.00-0.09], I^2=99%)**	**5% (95% CI [0.00=0.18], I^2=99%)**	0% (95% CI [0.00-0.00], v=10%)	4% (95% CI [0.00-0.19], I^2=100%)	1% (95% CI [0.00-0.01], I^2=62%)
Oral Ulcers	**7% (95% CI [0.01-0.19], I^2=99%)**	**13% (95% CI [0.02-0.30], I^2=99%)**	2% (95% CI [0.00-0.05], I^2=93%)	**15% (95% CI [0.02-0.36], I^2=99%)**	2% (95% CI [0.02-0.06], I^2=92%)
Oral Exanthem	**3% (95% CI [0.00-0.09], I^2=99%)**	**6% (95% CI [0.00-0.17], I^2=99%)**	1% (95% CI [0.00-0.03], I^2=83%)	4% (95% CI [0.02-0.12], I^2=99%)	2% (95% CI [0.00-0.05], I^2=92%)
Tonsillar Signs	**3% (95% CI [0.00-0.07], I^2=98%)**	**5% (95% CI [0.00-0.13], I^2=99%)**	1% (95% CI [0.00-0.04], I^2=91%)	**6% (95% CI [0.00-0.18], I^2=99%)**	2% (95% CI [0.00-0.04], I^2=87%)
Nasal Congestion	**1% (95% CI [0.00-0.03], I^2=94%)**	2% (95% CI [0.00-0.02], I^2=85%)	0% (95% CI [0.00-0.00], I^2=0%)	2% (95% CI [0.00-0.04], I^2=96%)	1% (95% CI [0.00-0.30], I^2=85%)
Shortness of Breath	**1% (95% CI [0.00-0.02], I^2=83%)**	2% (95% CI [0.00-0.06], I^2=96%)	0% (95% CI [0.00-0.00], I^2=0%)	1% (95% CI [0.00-0.03], I^2=79%)	0% (95% CI [0.00-0.10], I^2=79%)
Otalgia	**0% (95% CI [0.00-0.00], I^2=67%)**	0%	0%	0%	0%

*bolded text represents a significantly higher prevalence as compared to outbreak or region counterpart

Characteristics of Included Studies

Figure 2. Study design of included studies

- 1570 studies were identified from databases and screened
- 110 reports were sought for retrieval and assessed for eligibility
- 38 studies were included in analysis
- 5540 summed MPOX cases among all included studies

Figure 3. Number of MPOX cases from each country

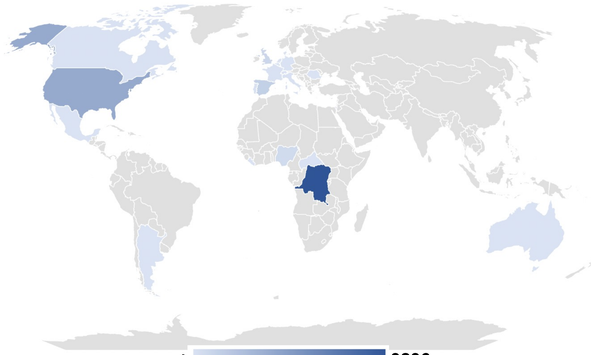
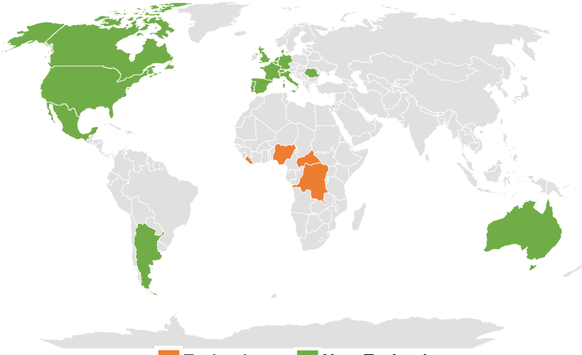


Figure 4. Endemicity of MPOX among countries in studies



Take-Home Points

- Most prevalent otolaryngologic features of MPOX: headache, cough, cervical lymphadenopathy, and sore throat
- Among all symptoms analyzed, none appear to have a higher prevalence in the 2022 outbreak as compared to previous outbreaks, suggesting an overall skew in the weighting of otolaryngologic feature importance in MPOX transmission patterns before the 2022 outbreak
- Cough, cervical lymphadenopathy, oral ulcers, & tonsillar signs were more prevalent in endemic areas; Headache was the only symptom more prevalent in non-endemic areas
- Inconsistent clinical presentation, especially in non-endemic regions, can make it difficult to recognize early signs of MPOX for the otolaryngologist
- Limitations include few prospective studies (mostly case reports & series), high heterogeneity among studies, publication bias, & variable vocabulary in symptom classification

Contact:
Tiana M. Saak
Columbia University Vagelos College of Physicians & Surgeons
tms2211@cumc.columbia.edu

References:
Moore MJ, Rathis B, Zaha F. Mpox (Monkeypox). In: StatPerals. StatPearls Publishing, Treasure Island (FL); 2022.
Monkeypox. Centers for Disease Control and Prevention. https://www.cdc.gov/poxvirus/monkeypox/about/index.html. Published 2023.
Manuscript citation for this study: Shah J, Saak TM, Desai AN, Gudis DA, Cheema HA, Abuelazm M, Preciado D, Zucker J, Overdevest JB. Otolaryngologic manifestations among MPOX patients: A systematic review and meta-analysis. *American Journal of Otolaryngology* 2023;44(6).