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ORAL AND PERIORAL MANIFESTATIONS IN MONKEYPOX PATIENTS: A SYSTEMATIC REVIEW OF CASE REPORTS AND CASE SERIES

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ABSTRACT

Background: Human monkeypox (MPX) is an infectious disease caused by the MPX virus. One of the manifestations caused by MPX in humans is lesions in the oral cavity and surrounding areas. This is of particular concern, especially for dentists, when identifying MPX through oral and perioral inspection. **Objective:** This study aims to systematically and comprehensively describe MPX patients' oral and perioral manifestations. **Methods:** Adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, a systematic literature search was conducted on the following databases: PubMed, ScienceDirect, Scopus, Wiley, and Google Scholar. Quality assessment was performed using the JBI critical appraisal checklist. **Results:** 824 articles were identified from the databases and 45 case report studies and 3 case series studies involving 57 MPX patients with oral and perioral manifestations were eligible for review. All included articles were rated moderate to high quality based on the quality assessment. According to the pooled data obtained, the most common prevalence of oral and perioral manifestations is ulcers (19.3%), followed by sore throat (18.6%), edema (10.7%), pustules (10%), erythema (7.9%), and vesicles (5.7%). Based on the location of oral and perioral lesions, the most common occurred in the oropharynx and pharynx (27.5%), perioral (17.4%), tongue (12.8%), tonsils (12.8%), and lips (10.1%). **Conclusion:** The most common oral and perioral manifestations in MPX patients are ulcers, sore throat, edema, pustules, erythema, and vesicles which can be found most often in the oropharynx/pharynx, perioral, tongue, tonsil and lip region.

Keywords: *monkeypox, monkeypox disease, MPX, oral, oropharynx, perioral*

INTRODUCTION

Human monkeypox (MPX) is an infectious disease that can be transmitted from animals to humans or humans to humans, caused by the MPX virus, which is classified under the *Orthopoxvirus* genus, which affected the human population after smallpox was eradicated, as officially confirmed by WHO in 1980.[1] The first case of MPX was identified in a 9-month-old male child in Congo in 1970.[2] As of February 1, 2023, there were a total of 85,536 cases of MPX worldwide, with Europe, the United States, and South America reporting the highest number of cases.[3] Even though MPX is a self-limiting disease, there are many cases of death related to this disease. The case fatality rate (CFR) during 1970-2022 was 4.14% (range 0.62%-9.51%).[4] Therefore, the World Health Organization (WHO) declared MPX a public health emergency of international concern.[5,6]

Due to its classification as an orthopoxvirus, MPX has the potential to be spread through zoonotic vectors. Various animal species, including squirrels, Gambian rats, monkeys, and several other non-primate mammals and primates, as well as rodents in Africa, are susceptible to the MPX virus and are possible reservoirs for the virus.[7,8] Zoonotic transmission can be through eating wild animal meat, contact with the body parts or bodily fluids of infected animals, or through the inhalation of droplets, among other means.[9] Meanwhile, human-to-human transmission is mediated through direct contact with rashes, scabs, and wounds on individuals infected with MPX. Furthermore, MPX can be transmitted by droplet infection and contact with contaminated objects and surfaces that have been exposed to an infected individual.[10] Although evidence shows that MPX transmission primarily happens in individuals who have a history of physical contact with individuals who have symptoms, there is a notable prevalence of MPX cases among individuals aged 20 to 50 who identify as bisexual or gay and engage in sexual activity.[11,12]

The general symptoms that manifest one to two weeks after an individual is infected with MPX are non-specific, as characterized by the appearance of fever, headache, rash, lymphadenopathy, myalgia, back pain, chills, fatigue, and oropharyngeal ulcers.

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[13,14] The majority of patients show moderate disease manifestations, thus not requiring hospitalization or antiviral therapy. However, potential complications of MPX may occur in patients, including bronchopneumonia, encephalitis, keratitis, secondary bacterial infections, sepsis and septic shock, cellulitis, dehydration, myocarditis, respiratory distress, and epiglottitis. [13,15,16] In addition, clinical manifestations in the form of lesions also appear on the face and extremities. According to WHO, lesions appear most commonly on the face with a prevalence of 95% of cases, 75% of lesions appear on the extremities, 75% appear as anthems or lesions on the oral mucous membrane, 30% of cases on the genitals and 20% of cases on the conjunctiva.[17]

Evidence suggests that lesions due to MPX infection may spread throughout the body, but they may appear in the facial region, specifically in the perioral region, oral mucosa, and oropharynx. Urgent medical and dental attention is necessary. Oral health practitioners, including dentists, must possess awareness regarding the features and clinical manifestations of MPX, given the significant responsibility of dentists in identifying endemic diseases and facilitating timely referrals for suitable follow-up treatment. Hence, the objective of this study was to review published case reports and case series regarding oral and perioral manifestations in patients infected with MPX, which is expected to be a reference for dentists in identifying oral and perioral lesions in patients with suspected MPX infection to increase the accuracy of identifying patients for diagnosis.

METHODS

This study is a systematic review of case reports and case series that adhere to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, aiming to comprehensively describe the oral and perioral manifestations in patients with MPX.

Information Sources

We conducted a systematic and comprehensive search of published case reports and case series through the following databases: PubMed, ScienceDirect, Scopus, Wiley, and Google Scholar. The initial search was performed in November 2023 and re-searched in June 2024 to avoid missing articles published after 2023.

Search Strategy

The literature search process focused on oral and perioral manifestations in patients with MPX. In this process, we used several keywords throughout the database that we have defined as follows: ("monkeypox" OR "monkeypox disease" OR "monkeypox virus" OR "MPX" OR "MPXV") AND ("oral manifestation" OR "oral lesions" OR “oral” OR “perioral” OR “mouth” OR “oropharynx”).

Inclusion and Exclusion Criteria

We limited articles published in English, case reports and case series studies, and articles discussing cases of MPX patients with oral or perioral manifestations, all articles published up to June 2024 were considered for review in this research, and no limitation for the year of publication was applied. We excluded review articles and articles discussing MPX patients who did not have oral or perioral manifestations.

Selection Process

All articles identified through the database and met the criteria were then grouped, and, if any, duplicates were removed. In this process, the Mendeley Reference Manager application was used. We then screened the title and abstract of the remaining articles, conducted by three authors (FMR, MI, and EPL), and irrelevant articles were excluded. The final process was carried out by two independent authors (FMR and MI) where we assessed the eligibility and quality of full-text articles for review in the research. In this process, if there were differences of opinion, careful consideration was carried out with other authors. All included articles were finally documented in Microsoft Excel for Windows.

Quality Assessment

All included articles were then assessed for quality using the Joanna Briggs Institute’s (JBI) critical appraisal checklist. This tool consists of 8 questions related to the assessment of the study, scored 1 if the answer was yes and 0 if the answer was no, unclear, or not applicable. Total quality scores ≤ 3, 4 to 6, and ≥ 7 were considered as low-, medium-, and high-quality studies, respectively. The quality assessment process

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was conducted by two reviewers (FMR and MI). Any disagreements were resolved through discussion.

Data Synthesis

Qualitative analysis was conducted by collecting, summarizing, and presenting all data from the included articles in the form of case reports and case series to comprehensively describe the oral and perioral manifestations of MPX.

RESULTS

Study Selection

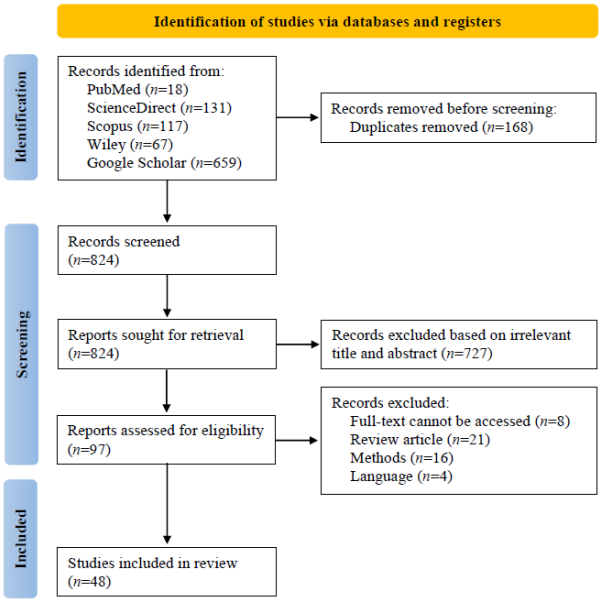

Figure 1. PRISMA flowchart of the article selection process.

The literature search results in the databases identified 824 articles after duplicates were removed. Based on the initial screening of titles and abstracts, 727 publications were excluded due to irrelevance to the topic of this systematic review, leaving 97 articles. Further eligibility assessment was conducted by two independent researchers (FMR and MI) resulting in 49 articles being excluded due to inaccessible full-text, review articles, unclear or inappropriate methods, and language. Finally, 48 articles were included for review. The entire study selection process is depicted in **Figure 1.**

Characteristics of Included Studies

In the search results, we collected a total of 57 MPX patients with oral and perioral manifestations from 45 case report studies and 3 case series studies, distributed across several countries, including 20 studies in the USA, [18–37] 1 in Congo, [38] 2 in Germany,[39,40] 1 in Korea,[41] 5 in Italy,[42,43,43–45] 1 in Czech,[46] 2 in France,[47,48] 2 in Portugal,[49,50] 1 in Cameroon,[51] 3 in Brazil,[52–54] 1 in Columbia,[55] 1 in Switzerland,[56] 1 in Romania,[57] 1 in Peru,[58] 1 in India,[59] 1 in Canada,[60] 1 in UK, [61] 1 in Mexico, [62] 1 in Spain, [63] and 1 in China. [64]

Based on the evaluation of study quality conducted using the JBI critical appraisal checklist, we rated 33 studies as high quality, 15 studies as moderate quality, and no studies as low quality.

All characteristics and results of the quality evaluation of the included studies are described in **Table 1**.

Table 1. Data on MPX patients with oral and perioral manifestations were collected from the included articles.

Reference	Country	Methods	Patient with Oral/Perioral Manifestation	Age	Oral/Perioral Manifestation	Location	Quality Score
Anderson et al.[21]	USA	Case report	1 (female)	School age	Dysphagia, sore throat, macules, vesicles	Oropharynx, perioral, tongue, peritonsil	6 (Moderate)
Sejvar et al.[33]	USA	Case series	1 (male) 2 (female)	30 y.o	Sore throat, papules	Pharynx, perioral	8 (High)
				33 y.o	Sore throat	Pharynx	
				6 y.o	Sore throat, edema, erythema, exudate	Pharynx, tonsil	
Eltvedt et al.[38]	Congo	Case report	1 (male)	4 y.o	Vesicles, papules, stomatitis	Perioral, lip, unspecified	4 (Moderate)

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Reference	Country	Methods	Patient with Oral/Perioral Manifestation	Age	Oral/Perioral Manifestation	Location	Quality Score
Ajmera et al.[18]	USA	Case report	1 (male)	26 y.o	Edema, sore throat, burning sensation, pseudomembrane, ulcer	Tongue, oropharynx, perioral	8 (High)
Ambrogio et al.[42]	Italy	Case report	1 (male)	39 y.o	Erythema, vesicles, ulcer, erosion	Perioral, lips	8 (High)
Ashish et al.[22]	USA	Case report	1 (male)	51 y.o	Pustules	Perioral	7 (High)
Bížová et al.[46]	Czech	Case report	1 (male)	34 y.o	Ulcer	Tonsil	4 (Moderate)
Costello et al.[26]	USA	Case report	1 (male)	28 y.o	Erosion, pustules	Unspecified, lower lip mucosa	5 (Moderate)
Davido et al.[48]	France	Case report	1 (male)	48 y.o	Limitation of mouth opening, edema	Peritonsil, unspecified	6 (Moderate)
Fischer et al.[39]	Germany	Case report	1 (male)	30 y.o	Papules, ulcer, edema, erythema	Tip of tongue, tonsil, pharynx	8 (High)
Jang et al.[41]	Korea	Case report	1 (male)	34 y.o	Sore throat, erosion	Pharynx, perioral	5 (Moderate)
Jarman et al.[51]	Cameroon	Case report	1 (male)	14 y.o	Ulcer	Unspecified	8 (High)
Lima et al.[52]	Brazil	Case report	1 (male)	41 y.o	Unspecified, ulcer	Perioral, oropharynx	8 (High)
Lopes et al.[53]	Brazil	Case report	2 (male)	28 y.o	Ulcers, vesicles, pustules, erythema	Oral commissure	7 (Moderate)
				28 y.o	Ulcers, vesicles, pustules, erythema	Oral commissure	
Lucar et al.[55]	Columbia	Case report	1 (male)	26 y.o	Ulcer, pustules	Lower lip, soft palate	8 (High)
Manoharan et al.[29]	USA	Case report	1 (male)	35 y.o	Pustules, erythema	Perioral	8 (High)
Mathieson et al.[56]	Switzerland	Case report	1 (male)	34 y.o	Sore throat, necrosis, stomatitis	Oropharynx, tonsils, anterior tongue	4 (Moderate)
Mileto et al.[44]	Italy	Case report	1 (male)	33 y.o	Sore throat, hyperemia	Oropharynx	8 (High)
Oprea et al.[57]	Romania	Case report	1 (male)	26 y.o	Dysphagia, hyperemia, petechiae	Pharynx, palate	6 (Moderate)
Ortiz-Martínez et al.[30]	USA	Case report	1 (male)	36 y.o	Sore throat, edema, erythema	Oropharynx, tonsil	8 (High)
Peters et al.[32]	USA	Case report	2 (male)	38 y.o	Ulcer	Ventral anterior of the tongue	5 (Moderate)
				30 y.o	Sore throat, ulcer	Dorsal anterior of tongue, pharynx	

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Reference	Country	Methods	Patient with Oral/Perioral Manifestation	Age	Oral/Perioral Manifestation	Location	Quality Score
Pisano et al.[65]	Italy	Case report	2 (male)	45 y.o	Ulcer, erosion, sore throat, erythema, exudate, edema, dysphagia	Lateral tongue, hard palate, tonsil, pharynx	7 (High)
				69 y.o	Ulcer, sore throat	Floor of mouth, pharynx	
Rodríguez et al.[58]	Peru	Case report	1 (male)	30 year	Sore throat, pustules	Pharynx, lower lip	7 (High)
Sturgis et al.[36]	USA	Case report	1 (male)	28 y.o	Ulcer	Unspecified	8 (High)
Wong et al.[37]	USA	Case series	3 (male)	44 y.o	Pustules, ulcer	Perioral	6 (Moderate)
				38 y.o	Pustules	Perioral	
				33 y.o	Pustules	Upper lip	
Yadav et al.[59]	India	Case report	1 (male)	35 y.o	Vesicles, edema	Lips, tongue	6 (Moderate)
Akpoigbe et al.[19]	USA	Case report	1 (male)	39 y.o	Edema, ulcer	Lips, perioral	8 (High)
Alsalihi et al.[20]	USA	Case report	1 (male)	71 y.o	Sore throat, ulcer, edema, erythema, exudate	Pharynx, tongue, tonsil, soft palate	8 (High)
Alsarhani et al.[60]	Canada	Case report	1 (male)	36 y.o	Sore throat, ulcer	Pharynx, lips	8 (High)
Amos et al.[61]	UK	Case report	1 (male)	40s y.o	Sore throat, erythema, exudate, ulcer, edema	Pharynx, peritonsil, tonsil, base of tongue, epiglottis	8 (High)
Attieh et al.[23]	USA	Case report	1 (male)	44 y.o	Ulcer, sore throat	Lips, buccal mucosa, oropharynx	8 (High)
Bakshi et al.[24]	USA	Case report	1 (male)	49 y.o	Pustules	Perioral	8 (High)
Baldovin et al.[43]	Italy	Case report	1 (male)	30 y.o	Ulcer	Perioral	8 (High)
Bartholomew et al.[25]	USA	Case series	2 (male)	30s y.o	Ulcer	Anterior of the tongue	7 (High)
				40s y.o	Ulcer	Lingual frenulum	
Baudouin et al.[47]	France	Case report	2 (male)	NM	Sore throat, nodules	Pharynx	4 (Moderate)
				NM	Sore throat, edema	Pharynx, tonsil	
Campos et al.[62]	Mexico	Case report	1 (male)	34 y.o	Sore throat, papules, pustules, ulcer	Perioral, pharynx, palate	8 (High)
Frade et al.[49]	Portugal	Case report	1 (male)	30 y.o	Sore throat, ulcer	Pharynx, edge and dorsum of the tongue	8 (High)
Hussein et al.[27]	USA	Case report	1 (male)	25 y.o	Edema, erythema, induration, pustules	Perioral	8 (High)

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Reference	Country	Methods	Patient with Oral/Perioral Manifestation	Age	Oral/Perioral Manifestation	Location	Quality Score
Jang et al.[28]	USA	Case report	1 (male)	32 y.o	Macule, vesicle, papule	Perioral, lips	8 (High)
Noe et al.[40]	Germany	Case report	1 (male)	26 y.o	Dysphagia, white spots	Pharynx, tonsil	4 (Moderate)
Nolasco et al.[45]	Italy	Case report	1 (male)	36 y.o	Sore throat, edema	Pharynx, tonsil	4 (Moderate)
Perzia et al.[31]	USA	Case report	1 (male)	36 y.o	Sore throat, macules, papules, vesicles and pustules	Pharynx	8 (High)
Raffaele et al.[54]	Brazil	Case report	1 (male)	20 y.o	Ulcer	Perioral	8 (High)
Sanromán Guerrero et al.[63]	Spain	Case report	1 (male)	40 y.o	Sore throat, edema, ulcer	Pharynx, uvula, tonsil	8 (High)
Smith et al.[34]	USA	Case report	1 (male)	38 y.o	Pseudomem-brane	Tongue	8 (High)
Studemeister et al.[35]	USA	Case report	1 (transgender female)	42 y.o	Sore throat, dysphagia, edema	Pharynx, tonsil	8 (High)
Chen et al.[64]	China	Case report	1 (male)	29 y.o	Papule	Lips, perioral	8 (High)
Martín Fernandes et al.[50]	Portugal	Case report	1 (male)	23 y.o	Sore throat, dysphagia, exudate	Oropharynx	7 (High)

Based on **Table 1.** above, it can be seen that the characteristics of the patients in this study are, of the 57 patients, 53 patients were male, 3 patients were female, and 1 patient was a female transgender. The distribution of patients based on age group was 0 infants (0-1 year) (0%), 2 children (2-10 years) (3.5%), 1 adolescent (11-19 years) (1.8%), 49 adults (20-60 years) (86%), 2 elderly (>60 years) (3.5%), and 3 unspecified/not mentioned (5.3%).

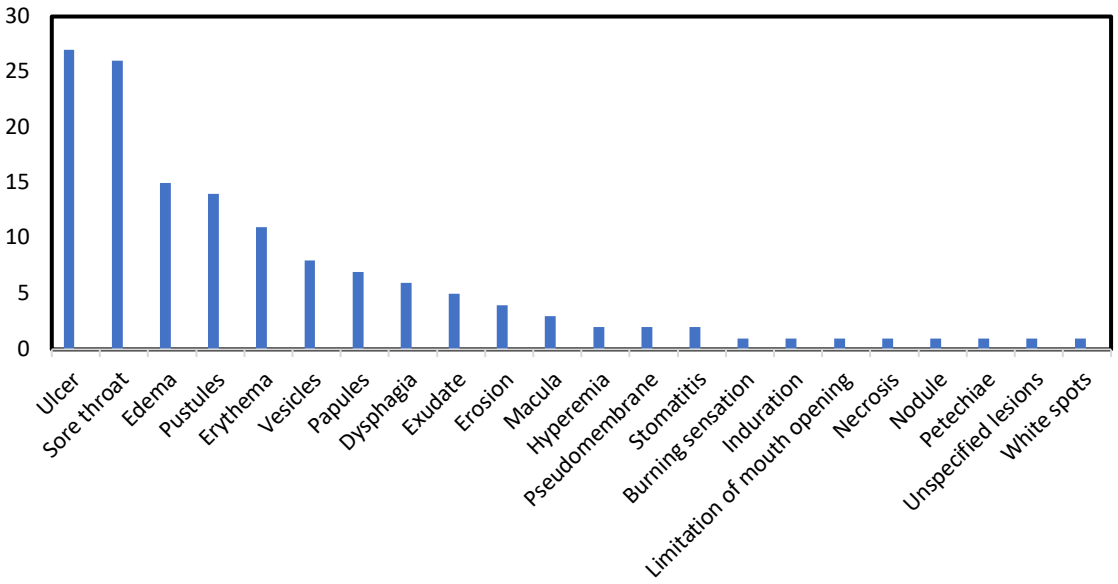

Figure 2. Prevalence of oral and perioral manifestations in MPX patients.

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MPX cases in previous studies reported that clinical examination found accompanying oral and/or perioral lesions in MPX patients. The distribution of oral and/or perioral lesions found in patients is illustrated in **Figure 2** where it was found that 19.3% of them had ulcers, 18.6% sore throat, 10.7% edema, 10% pustules, 7.9% erythema, 5.7% vesicles, 5% papules, 4.3% dysphagia, 3.6% exudate, 2.9% erosion, 2.1% macula, 1.4% hyperemia, 1.4% pseudomembrane, 1.4% stomatitis, 0.7% burning sensation, 0.7% induration, 0.7% limitation of opening the mouth, 0.7% necrosis, 0.72% petechiae, 0.7% unspecified lesions, and 0.7% white spots.

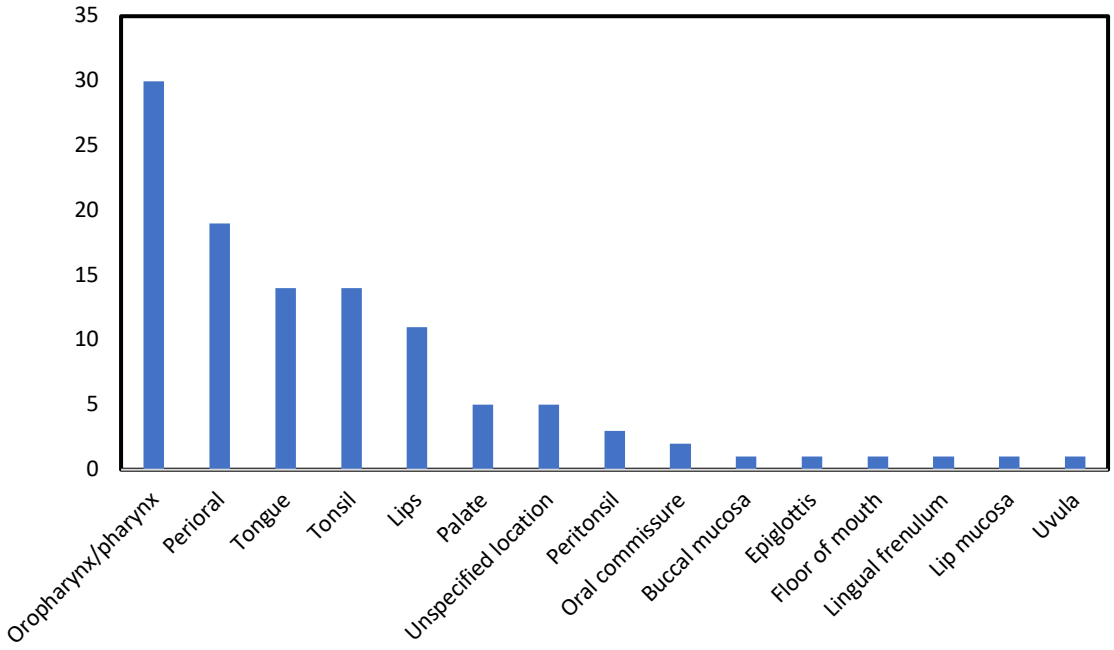

Figure 3. Prevalence of the location of oral and perioral manifestations in MPX patients.

Based on the location of the oral and perioral manifestation lesions presented in **Figure 3**, the predilection for lesions in 27.5% of patients was found in the oropharynx/pharynx, 17.4% in the perioral, 12.8% in the tongue, 12.8% in the tonsils, 10.1% in the lips, 4.6% in the palate, 4.6% in unspecified location, 2.8% in the peritoneal, 1.8% in the oral commissure, 0.9% in the epiglottis, 0.9% in the floor of the oral cavity, 0.9% in the lingual frenulum, 0.9% in the lip mucosa, and 0.9% in the uvula.

DISCUSSION

MPX exhibits symptoms in the oral and perioral regions, with 70% of all MPX cases presenting mucosal manifestations in the oral cavity and lips with the appearance of oral lesions emerging at the onset of an individual being infected with MPX. [66,67] The oral and perioral regions are among the predilection sites for viral infection conditions. This is because the oral cavity becomes the outermost organ that is in continuous contact with the outside environment. The spread of viral and bacterial infections spread through airborne and droplets can enter the body through the oral region which will spread to the systemic body. [68] Infections that occur can give clinical manifestations to the body such as fever, malaise, myalgia, and other clinical manifestations.[69] However, the infection that occurs is also capable of providing typical clinical manifestations in the oral and perioral regions of both the type of lesion found and the typical predilection of certain viral infections. [70] Although it is unlikely that dentists will encounter patients who may have confirmed or suspected MPX infection, dental health professionals in areas with a high incidence of MPX will be more likely to encounter patients with confirmed MPX in the dental clinic. However,

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perhaps the dentist will see MPX patients at the dental clinic if the symptoms of MPX are mild and limited to the oral and perioral region.[71] Hence, dentists must remain aware of the potential occurrence of MPX patients in their dental clinic, as they are typically the primary healthcare providers who can identify, diagnose, and possibly treat the oral and perioral lesions associated with MPX infections. Therefore, dentists must possess a comprehensive understanding of the characteristics of oral and perioral manifestations in patients with MPX.[72]

The findings from this systematic review study show that the common oral and perioral manifestations found in MPX patients are ulcers (19.3%), followed by sore throat (18.6%), edema (10.7%), pustules (10%), erythema (7.9%), and vesicles (5.7%). This is by research conducted by Joseph et al. which states that ulcers in the oral cavity or oropharynx can be the primary lesion in patients with MPX compared to lesions that appear on the skin, noting that almost a quarter of MPX patients experience ulcers.[73] In addition, a study conducted by Jaiswal et al. reported a total of 1,078 patients infected with MPX, 96% of them had oral manifestations in the form of ulcers.[74] In line with the results of our study, research conducted by Ogoina et al. which described the symptoms in twenty-one MPX patients showed that oral sores were the most common oral manifestation (52.4%) followed by sore throat (42.9%).[75] The forms of oral and perioral manifestations in our study are also corroborated by research conducted by Issa et al. which stated that sore throat (15.7%), ulcers (11.9%), vesicles (10.4%), and erythema (6%) were the most common types of oral manifestations.[72] Likewise, research by Gandhi et al. analyzed the pooled prevalence and showed that some of the most common oral manifestations, similar to our findings, were sore throat (39.96%; 95% CI=21.42-59.91) and mouth sore (24.80%; 95% CI=8.14-46.32).[76] Similar research was also conducted by Philpott et al. which reported that lesions manifesting in the mouth, lips, and oral mucosa in 1,004 patients confirmed with MPX was quite high, namely 24.9%.[77] Liu et al. in their meta-analysis also reported that of the 48,622 patients analyzed, 23.4% (95% CI=20.2-26.7) of them had oropharyngeal manifestations in the form of sore throat and 20.8% (95% CI=15.2-27.1) of patients had oral and/or oropharyngeal lesions.[78]

Regarding the location of oral and perioral manifestations, we found that the most common locations were oropharynx and pharynx (27.5%), perioral (17.4%), tongue (12.8%), tonsils (12.8%), and lips (10.1%). Our findings are corroborated by a study conducted by Issa et al. who reported that the oropharynx/pharynx (26.9%) was the most common oral manifestation site in MPX patients, followed by tonsils (15.4%), tongue (12.8%), perioral (11.5%), and lips (9%).[72] The study conducted by Tarín-Vicente et al. also reported oral manifestations in MPX patients with papules, vesicles, and/or pustules most commonly occurring in the perioral (28%), oral (20%), and complications in the tonsils (10%).[79] The study conducted by Grau Echevarría et al. concluded that the location of oral and perioral manifestations in MPX patients was found most commonly in the pharynx in the form of pharyngitis and perioral (35%).[80] Prasad et al. also reported the anatomical sites of lesions that manifested in the oral and perioral region most commonly found in the pharynx (20.8%) in the form of sore throat and intraoral and/or oropharynx (14.9%) in the form of oral lesions.[81] Liu et al. corroborate their meta-analysis reporting that lesions in MPX patients also manifest in oral and oropharyngeal locations (20.8%; 95% CI=15.2-27.1).[78]

Based on the results of our systematic review conducted, we conclude that the proportion of oral and perioral manifestations in patients infected with MPX is quite high. The high prevalence of oral and perioral lesions in patients can be one of the considerations for doctors and other health workers to consider oral and perioral lesions in diagnosing MPX infection. Oral and perioral lesions with a specific predilection in previous studies show that patients with MPX infection have unique oral and perioral clinical signs that can be a special marker when inspecting the oral and perioral region by a doctor. In this case, the dentist is expected to be the first line who is responsible for conducting anamnesis, examination, identification, and diagnosis of oral and perioral lesions commonly associated with MPX infections that are encountered, so that further additional examinations can be carried out by specialist doctors and facilitate a prompt and accurate diagnosis, allowing for early administration of appropriate treatment.

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Review studies are prone to bias, so we acknowledge this as a limitation of this systematic review. In addition, to the lack of research conducted regarding oral and perioral manifestations in MPX patients, it is hoped that future research can be carried out regarding the mechanism and relationship between each oral and perioral lesion and the incidence of MPX infection. This aims to provide knowledge regarding the pathophysiology of each lesion found so that dentists are expected to be able to provide the appropriate type of palliative and symptomatic treatment to relieve oral and perioral lesions that manifest in patients with MPX.

CONCLUSION

Based on the findings, we highlight that the common oral and perioral manifestations found in MPX patients are ulcers, sore throat, edema, pustules, erythema, and vesicles. Meanwhile, the common locations where oral and perioral manifestations of lesions are found are the oropharynx and pharynx, perioral, tongue, tonsils, and lips.

ETHICAL APPROVAL

There is no ethical approval.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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AUTHOR CONTRIBUTIONS

Conceptualization, FMR, and MI; methodology, FMR, MI, and EPL; validation, FMR, and MI; formal analysis, FMR, and MI; writing—original draft preparation, FMR, and RSSL; writing—review and editing, MI, and RSSL.

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