Mpox: Characterization and Clinical Outcomes of Patients in Colombian Healthcare Institutions.

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Introduction:

The monkeypox(mpox) virus triggered a worldwide outbreak by Clade IIb in 2022. While this outbreak had widespread effects, there needs to be more information on mpox's specific impact in Colombia, particularly regarding how it is managed, its burden, and its epidemiology. This research seeks to examine the clinical presentation, and health outcomes of individuals diagnosed with mpox infection.

Methods:

This retrospective study was conducted in health institutions in Colombia based on clinical records from Jan 2022 to Dec 2023. Clinical and epidemiological characteristics were collected from diagnosis until discharge(or death). Participants in the study were diagnosed through molecular methods and their clinical evolution was tracked through medical records.

Results:

One thousand four hundred thirteen individuals (97·2% male) were included in this study. Majority(54%, 764/1,413 individuals) were persons living with HIV(PWH) and almost one-third of them(30.1%, n=284) had concomitant sexually transmitted diseases and HIV, with syphilis being the most prevalent(20·4%). Complications were infrequent, with cellulitis being the most common, women living with HIV showed a higher rate of emergency room visits and known mpox contacts. Although not statistically significant, gastrointestinal, musculoskeletal, respiratory, and STI symptoms were more common in the virologically non-suppressed HIV group. No significant differences were found based on CD4 count in PWH.

Conclusion:

Over half of the participants were people living with HIV(PWH), while skin lesions and complications varied, no significant differences were linked to CD4 count or viral load suppression. Mpox symptomatology was not significantly associated with unsuppressed viral loads or low CD4 levels, highlighting the need for further research.

Keywords: Mpox, Monkeypox, Outbreak, Colombia, complications, HIV.

INTRODUCTION

Mpox (formerly known as monkeypox) is a viral disease caused by the human monkeypox virus (hMPXV), a zoonotic virus belonging to the Orthopoxvirus genus of the Poxviridae family.[1] The first human case was reported in 1970 in the Democratic Republic of Congo.[2,3,4] Until 2022, most reported cases were described in Africa and caused by Clades I and IIa. [5,6,7]

In 2022, the largest and most extensive outbreak of mpox was documented, attributed to clade IIb.[5] According to the World Health Organization (WHO), a cumulative total of 99,176 laboratory-confirmed cases of mpox, including 208 deaths, have been reported to World Health Organization (WHO) from 116 countries between January 1, 2022, through Junel 30, 2024. [8] This new outbreak differs significantly from what was observed in Africa regarding how the virus spreads, the symptoms it presents, the affected population, lethality, and other factors.[3,4,8-10] However, it is worth noting that the growth in the last year of mpox cases is also due to the increase in cases in Africa by clades Ia and Ib.[8,11]

There is very limited evidence that people with HIV (PWH), especially those with low CD4 cell counts or who are not virologically suppressed, are more likely to experience critical outcomes such as death if they contract mpox. Although the number of mpox cases has decreased significantly since the peak of the epidemic, it remains to be evaluated whether the severe necrotizing form due to mpox can be considered an opportunistic infection in people with uncontrolled HIV. Considering that Colombia is the sixth country in the world with the highest number of reported cases of mpox and that the hMPXV continues to circulate in various regions of the world and, with the emergence of new clades with new clinical manifestations and lethality,[11] this research aims to gather information on the clinical characteristics of mpox caused by IIb clade from health-providing institutions in Colombia between 2022-2023.

METHODS

This retrospective study was conducted in fourteen health institutions in Colombia through PAHO/WHO and National University calls to participate in a clinical registry network. The institutions that shared clinical data were Clínica Universitaria Colombia, Clínica Reina Sofía, Clínica Iberoamérica, Clínica Sebastián de Belalcázar, Clínica Santa María del Lago, Clínica la Inmaculada, Infectoclínicos, Corporación de la Lucha contra el SIDA, Virrey Solís IPS, Hospital

de la Sabana, Hospital Universitario del Valle, Hospital Alma Mater, Hospital La María, centros médicos Sanitas Teusaquillo; it was based on clinical records from 2022 through 2023.

Procedures

This study included all individuals diagnosed with mpox in the participating institutions between January 2022 and December 2023. All individuals had a confirmed mpox diagnosis by PCR perfomed at the National Institute of Health of Colombia and were followed using medical records. The main hospitalization criteria, demographic information, clinical characteristics, and outcome values were based on the Case Report Forms (CRF) proposed by the WHO,[12] specifically the mpox CRF.

Statistical Analysis

Univariate descriptive analysis was conducted for all variables, and the report was tailored to the nature of the variables. Quantitative variables are presented as measures of central tendency and dispersion. For qualitative variables, the description utilized absolute and cumulative frequencies. To compare PWH and people without HIV (PWoH), a Welch Two Sample t-test was carried out using a Standardized Mean Difference with a 2-sample test for equality of proportions without continuity correction and two sample tests for equality of proportions. Specific groups were created regarding the approach and presentation of composite variables, such as body mass index (BMI), CD4 lymphocyte count, and viral load. For BMI, the WHO proposed categories were used (Underweight <20, Normal 20-24·9, Overweight 25-29·9, Obese 30-34·9, and Extremely Obese >35). For viral suppression, a viral load threshold of 200 viral particles per millilitier of blood was established (≤200 suppressed and >200 not suppressed). For CD4 count, the threshold for AIDS were used (<200 and ≥200 cell/uL). Additionally, the following age groups were analysed: 0 to 4 years old, 5 to 14 years old, 15 to 44 years old, 45 to 64 years old, and over 64 years old. Statistical processing was conducted using R Software® (version 4.3.0).

Ethics statement

This study adhered to the principles outlined in the Helsinki Declaration, including its subsequent amendments, and followed comparable ethical standards. The research protocol received approval from the Ethical Committee of Clinica Colsanitas and Unisanitas (CEIFUS 2495-22) and the necessary approvals from other collaborating institutions involved in the project. The

commitment to ethical guidelines and the rigorous review process ensures the protection of participants' rights and the integrity of the study following established ethical norms.

Results

Population characteristics

One thousand four hundred thirteen individuals were enrolled in the study (Table 1), comprising predominantly males (n= 1,376, 97·2% of the cohort, with only 39 females). The average age of the enrolled individuals was 33 years (standard deviation [SD] 7·8), 91·1% of the men were under 45, and no people over 65 were reported. In females, 89·7% were under 45 years of age, and only one person over 65 years of age was reported. The number of unresolved lesions was higher in males than in females (6-100 lesions vs. 1-25, respectively. Additionally, the number of lesions in each body region was higher in males than in females (1-16 vs. 1-2). Notably, 47 individuals reported international travel three weeks before symptoms, covering destinations such as Brazil, Mexico, Argentina, Panama, Ecuador, Peru, Netherlands, the United States, and the United Arab Emirates. None of the 39 females included in this study were pregnant; 36 individuals (2·6%) were health workers; 16% were aware of having a sexual partner or contact with mpox. None of the individuals in this case series received mpox-specific treatment nor had access to previous mpox vaccinations.

Table 1. Demographic and Clinical Characteristics in Colombian confirmed mpox cases by sex

Characteristic	**Male**, N = 1,353[1]	**95% CI**[2]	**Female**, N = 39[1]	**95% CI**[2]	**Difference**[3]	**95% CI**[23]	**p-value**[3]	**q-value**[4]
Age	32 (28, 37)	33, 33	28 (24, 36)	28, 35	1.6	-2.1, 5.4	0.4	0.7
age_groups					0.23	-0.09, 0.55		
15 to 44 years old	1,232 (91%)	89%, 92%	35 (90%)	75%, 97%				
45 to 64 years old	121 (8.9%)	7.5%, 11%	3 (7.7%)	2.0%, 22%				
older than 65 years old	0 (0%)	0.00%, 0.35%	1 (2.6%)	0.13%, 15%				
Lymphadenopathy	1,353 (100%)	100%, 100%	39 (100%)	89%, 100%	0.00%	0.00%, 0.00%		
Syphilis	58 (4.3%)	3.3%, 5.5%	0 (0%)	0.00%, 11%	4.3%	1.9%, 6.7%	0.4	0.7

Characteristic	Male, N = 1,353[1]	95% CI[2]	Female, N = 39[1]	95% CI[2]	Difference[3]	95% CI[23]	p-value[3]	q-value[4]
Sexually Transmitted Infections	280 (21%)	19%, 23%	4 (10%)	3.3%, 25%	10%	-0.64%, 22%	0.2	0.5
PWH	748 (55%)	53%, 58%	5 (13%)	4.8%, 28%	42%	30%, 55%	<0.001	<0.001
Proctitis symptomatology	113 (8.4%)	7.0%, 10%	0 (0%)	0.00%, 11%	8.4%	5.6%, 11%	0.11	0.5
Urethritis symptomatology	23 (1.7%)	1.1%, 2.6%	1 (2.6%)	0.13%, 15%	-0.86%	-6.7%, 5.0%	>0.9	>0.9
Sore throat symptomatology	1,353 (100%)	100%, 100%	39 (100%)	89%, 100%	0.00%	0.00%, 0.00%		
Psychological disturbances	8 (0.6%)	0.28%, 1.2%	0 (0%)	0.00%, 11%	0.59%	-0.41%, 1.6%	>0.9	>0.9
Skin lesions	1,353 (100%)	100%, 100%	39 (100%)	89%, 100%	0.00%	0.00%, 0.00%		
Respiratory symptoms	310 (23%)	21%, 25%	9 (23%)	12%, 40%	-0.16%	-14%, 13%	>0.9	>0.9
Musculoskeletal symptoms	390 (29%)	26%, 31%	9 (23%)	12%, 40%	5.7%	-9.0%, 21%	0.5	0.9
Gastrointestinal symptoms	70 (5.2%)	4.1%, 6.5%	1 (2.6%)	0.13%, 15%	2.6%	-3.8%, 9.0%	0.7	>0.9
Antibiotics	60 (4.4%)	3.4%, 5.7%	0 (0%)	0.00%, 11%	4.4%	2.0%, 6.9%	0.3	0.7
Antifungal	2 (0.1%)	0.03%, 0.59%	0 (0%)	0.00%, 11%	0.15%	-0.20%, 0.50%	>0.9	>0.9
Antiviral	521 (39%)	36%, 41%	2 (5.1%)	0.89%, 19%	33%	25%, 42%	<0.001	<0.001
BMI Groups[5]					0.77	0.24, 1.3		
Normal	299 (60%)	56%, 64%	11 (79%)	49%, 94%				
Underweight	19 (3.8%)	2.4%, 6.0%	0 (0%)	0.00%, 27%				
Overweight	153 (31%)	27%, 35%	1 (7.1%)	0.37%, 36%				
Obese	19 (3.8%)	2.4%, 6.0%	1 (7.1%)	0.37%, 36%				

Characteristic	Male, N = 1,353[1]	95% CI[2]	Female, N = 39[1]	95% CI[2]	Difference[3]	95% CI[23]	p-value[3]	q-value[4]
Extremely obese	7 (1.4%)	0.62%, 3.0%	1 (7.1%)	0.37%, 36%				
Unknown	856		25					

[1]Median (IQR); n (%)

[2]CI = Confidence Interval

[3]Welch Two Sample t-test; Standardized Mean Difference; 2-sample test for equality of proportions without continuity correction; Two sample test for equality of proportions

[4]False discovery rate correction for multiple testing

[5]Body Mass Index (BMI. Underweight <20, Normal 20-24.9, Overweight 25-29.9, Obese 30-34.9, and Extremely Obese >35)

PWH = people with HIV

Complications were infrequent, with cellulitis being the most common reported in only five individuals. Other complications included shock, acute respiratory distress syndrome, necrotizing cellulitis, abscesses, and bleeding disorders. Two patients died. The first was a 29 years-old man, recently diagnosed with HIV, CD4 cell count 33/mm3, and an HIV viral load of 32,000copies/ml (Log 4·5). He did not begin antiretroviral treatment and did not have other opportunistic infections reported. His cause of death was described as septic shock. The second patient was a 28 years-old man. One week before his death, he had his first positive HIV test. He had no analysis of CD4 cell count nor HIV viral load. He had lesions in the genital area, with necrotizing fasciitis that was reported as the cause of death.

Skin lesions and lymphadenopathy were ubiquitous among all individuals (Figure 1); within the extremities, the arms were affected in 273 (20·2%) of cases, and the genitals were the most frequently affected anatomic site (524, 37%). Other areas reported as affected in a few individuals included the scalp, neck, and wrists, contributing to the diverse distribution of lesions throughout the body. The diversity of lesion types was notable, encompassing macules 167 (12·4%), abscess 347 (25·7%), early vesicles 269 (19·9%), small pustules 189 (13·9%), umbilicated pustules 63 (4·7%), ulcerated lesions 82 (6·1%), crusting of mature lesions 113 (8·4%), and partially removed scabs (4·9%). Proportionally, females reported significantly more lesions (active or otherwise) in the legs (43·6% vs 27.8% p-value = 0·048), arms (31·6% vs 48·7% p-value 0·038) and oral mucosa (12.3% vs 30.8%, p-value 0.002), whereas males presented more in soles of feet (2·7% vs. 0·0%, p-value 0·004), genitals (39·3% vs. 17·9%, p-value 0·0173) and perianal (16·8% vs

2·6%, p-value 0·044) (Figure 2). but not in other regions. No differences were found between the type, number of lesions, location, and severity.

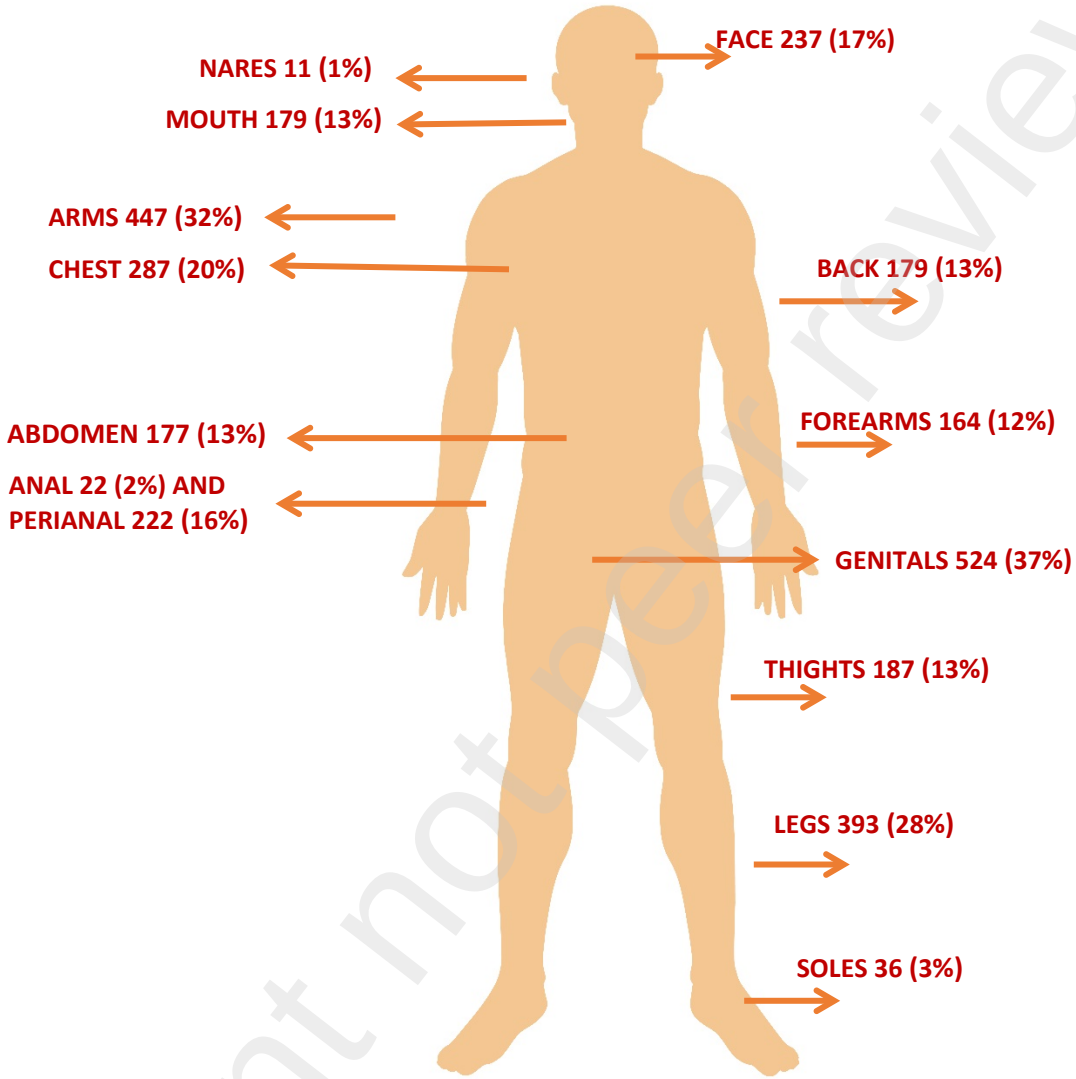

Figure 1. Distribution of skin lesions in Colombian confirmed mpox cases.

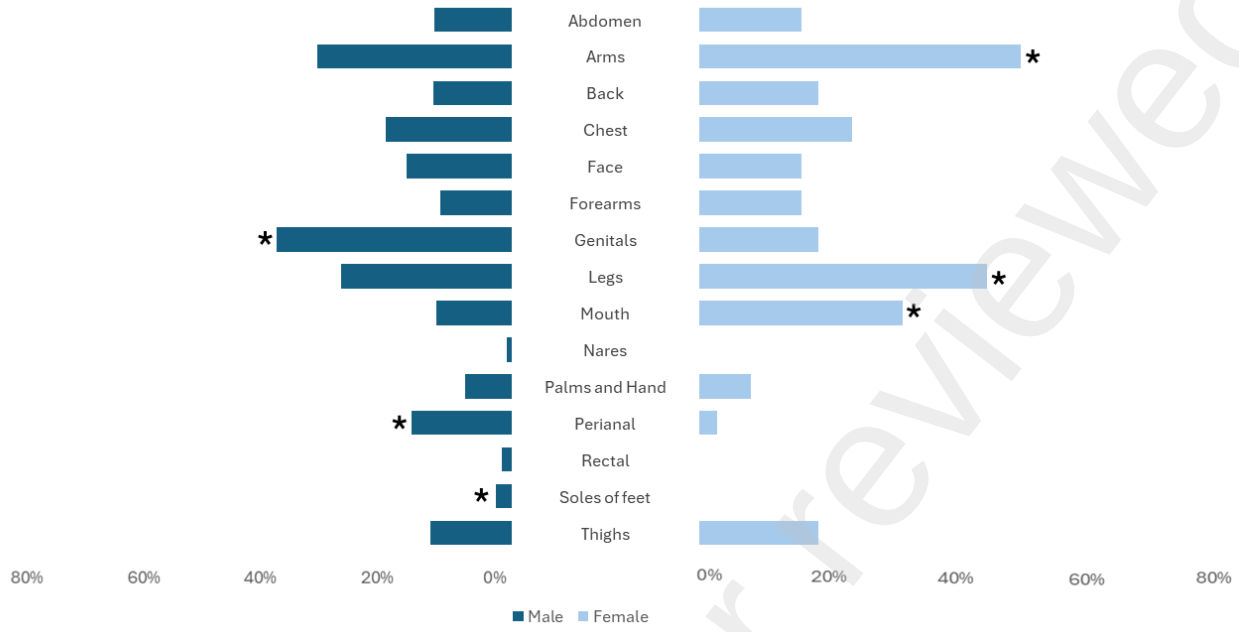

Figure 2. Differences in the distribution of lesions between males and females with statistically significant ones shown with an asterisk (*).

Comparing variables and characteristics by BMI groups

As obesity has been identified as a risk factor for developing more severe disease in certain conditions, we performed an analysis by BMI groups. Regarding this characteristic, 60.3% had a normal BMI, 30·3% were overweight, 3·5% were underweight, 3·9% were obese, and 1·8% were extremely obese. Most females (37 individuals) had a normal body weight (78·6%). No differences by BMI were found regarding antibiotic, antifungal or antiviral use, psychological symptoms, respiratory symptoms, muscle and bone symptomatology, and gastrointestinal symptoms.

People living with HIV (PWH)

Nearly half of the population (754/1,413 patients, 99·3% male) were PWH. Almost one-third (31%, n=284) of individuals had concomitant sexually transmitted diseases and HIV, with syphilis being the most prevalent (20·4%), followed by infections due to *Neisseria gonorrhoea*e (16·4%).

PWH had a higher proportion of gastrointestinal symptoms and genital symptoms. PWH had a higher proportion of other STIs (p-value 0·0026) than PWoH. Overall, PWoH were younger than PWH (30±13·2vs. 33±12·5, p-value <0·001), being over-represented among individuals aged between 15 and 44 (p-value 0·0097). Other statistically significant and non-significant characteristics can be seen in Table 2.

Table 2. Comparison of Clinical Characteristics in Colombian confirmed mpox cases by HIV status.

Characteristic	**PWoH** n = 639[1]	**95% CI**[2]	**PWH**, n = 754[1]	**95% CI**[2]	**Difference**[3]	**95% CI**[23]	**p-value**[3]	**q-value**[4]
Age	30 (26, 36)	31, 32	33 (29, 38)	34, 35	-2.7	-3.5, -1.9	<0.001	<0.001
Age groups (years old)					0.15	0.05, 0.26		
15 to 44	596 (93%)	91%, 95%	672 (89%)	87%, 91%				
45 to 64	43 (6.7%)	5.0%, 9.0%	81 (11%)	8.7%, 13%				
older than 65	0 (0%)	0.00%, 0.74%	1 (0.1%)	0.01%, 0.86%				
Lymphadenopathy	639 (100%)	99%, 100%	754 (100%)	99%, 100%	0.00%	0.00%, 0.00%		
Syphilis	5 (0.8%)	0.29%, 1.9%	53 (7.0%)	5.4%, 9.2%	-6.2%	-8.3%, -4.2%	<0.001	<0.001
Sexually Transmitted Infections	22 (3.4%)	2.2%, 5.3%	262 (35%)	31%, 38%	-31%	-35%, -27%	<0.001	<0.001
Proctitis symptomatology	22 (3.4%)	2.2%, 5.3%	91 (12%)	9.9%, 15%	-8.6%	-11%, -5.8%	<0.001	<0.001

Characteristic	PWoH n = 639[1]	95% CI[2]	PWH, n = 754[1]	95% CI[2]	Difference[3]	95% CI[23]	p-value[3]	q-value[4]
Urethritis symptomatology	3 (0.5%)	0.12%, 1.5%	21 (2.8%)	1.8%, 4.3%	-2.3%	-3.7%, -0.88%	0.002	0.003
Sore throat symptomatology	639 (100%)	99%, 100%	754 (100%)	99%, 100%	0.00%	0.00%, 0.00%		
Psychological disturbances	2 (0.3%)	0.05%, 1.3%	6 (0.8%)	0.32%, 1.8%	-0.48%	-1.4%, 0.43%	0.4	0.5
Skin lesions	639 (100%)	99%, 100%	754 (100%)	99%, 100%	0.00%	0.00%, 0.00%		
Respiratory symptoms	141 (22%)	19%, 26%	178 (24%)	21%, 27%	-1.5%	-6.1%, 3.0%	0.5	0.6
Musculo-skeletal symptoms	187 (29%)	26%, 33%	212 (28%)	25%, 31%	1.1%	-3.8%, 6.1%	0.7	0.7
Gastrointestinal symptoms	19 (3.0%)	1.9%, 4.7%	52 (6.9%)	5.2%, 9.0%	-3.9%	-6.3%, -1.5%	0.001	0.002
Antibiotics	15 (2.3%)	1.4%, 3.9%	45 (6.0%)	4.4%, 8.0%	-3.6%	-5.8%, -1.4%	0.001	0.002

PWH: people with HIV, PWoH: People without HIV

[1]Median (IQR); n (%),[2]CI = Confidence Interval

[3]Welch Two Sample t-test; Standardized Mean Difference; 2-sample test for equality of proportions without continuity correction; Two sample test for equality of proportions

[4]False discovery rate correction for multiple testing

Although non-statistically significant, gastrointestinal, muscle and bone symptomatology, psychological disturbances, respiratory symptoms, the presence of other STIs, the presence of syphilis, and urethritis symptomatology were present in a higher proportion in the non-suppressed group. In contrast, proctitis symptomatology was higher in the suppressed group but not statistically significant. These results can be seen in Table 3.

Table 3. Clinical characteristics in Colombian PWH with confirmed mpox by virological suppression status

Characteristic	Non-suppressed, N = 57[1]	95% CI[2]	Suppression, N = 195[1]	95% CI[2]	Difference[3]	95% CI[23]	p-value[3]	q-value[4]
Age	33 (28, 38)	32, 36	34 (29, 39)	34, 36	-1.2	-3.4, 1.1	0.3	0.7
Lymphadenopathy	57 (100%)	92%, 100%	195 (100%)	98%, 100%	0.00%	0.00%, 0.00%		
Syphilis	4 (7.0%)	2.3%, 18%	7 (3.6%)	1.6%, 7.6%	3.4%	-4.8%, 12%	0.5	0.7
Sexually Transmitted Infections	14 (25%)	15%, 38%	34 (17%)	13%, 24%	7.1%	-6.4%, 21%	0.3	0.7
Proctitis symptomatology	6 (11%)	4.4%, 22%	29 (15%)	10%, 21%	-4.3%	-15%, 6.2%	0.5	0.7
Urethritis symptomatology	3 (5.3%)	1.4%, 16%	5 (2.6%)	0.95%, 6.2%	2.7%	-4.6%, 10%	0.6	0.7
Sore throat symptomatology	57 (100%)	92%, 100%	195 (100%)	98%, 100%	0.00%	0.00%, 0.00%		
Psychological disturbances	1 (1.8%)	0.09%, 11%	1 (0.5%)	0.03%, 3.3%	1.2%	-3.4%, 5.9%	>0.9	>0.9
Respiratory symptoms	20 (35%)	23%, 49%	43 (22%)	17%, 29%	13%	-1.8%, 28%	0.068	0.4
Musculoskeletal symptoms	22 (39%)	26%, 52%	49 (25%)	19%, 32%	13%	-1.7%, 29%	0.069	0.4
Gastrointestinal symptoms	8 (14%)	6.7%, 26%	13 (6.7%)	3.7%, 11%	7.4%	-3.4%, 18%	0.13	0.5

[1]n (%); Median (IQR)

[2]CI = Confidence Interval

[3]Standardized Mean Difference; Welch Two Sample t-test; 2-sample test for equality of proportions without continuity correction; Two sample test for equality of proportions

[4]False discovery rate correction for multiple testing

Next, we compared PWH based on their CD4 T cell count, using it as a proxy for immune status, as a CD4 count of less than 200 cells/mm³ is a key marker for an AIDS diagnosis this cutoff was

chosen to do the following analysis. No statistically significant differences in age, musculoskeletal symptoms, proctitis and other conditions were detected among those groups (Table 4). PWH in the study was undergoing antiretroviral therapy (ART) with specific drug regimens, including tenofovir disoproxil fumarate/emtricitabine, abacavir/lamivudine, efavirenz, atazanavir, and atazanavir/ritonavir. According to the latest HIV viral load results, 22·6% of patients receiving ART were not virally suppressed; the viral load measured was 11,633·24 ± 54,966·62 copies/mL. When comparing PWH and PWoH who visited the emergency room, PWH had a higher frequency of consultations (78·3% vs 48·3%, p-value <0·00001). They used outpatient services to a lesser extent (9·8% vs 36·4% p-value <0·0001). No differences were found in the use of other services. Although not statistically significant, PWH had a higher proportion of known mpox contacts (16·8% vs. 14·2% p-value 0·1802) in the 21 days prior. There were no differences in age, healthcare or laboratory worker status, or international travel before symptom onset.

Table 4. Proportion and clinical characteristics in Colombian PLWH with confirmed mpox analyzed by CD4 count.

Characteristic	**≥200 Cells/mm³**, N = 365[1]	**95% CI**[2]	**<200 Cells/mm³**, N = 44[1]	**95% CI**[2]	**Difference**[3]	**95% CI**[23]	**p-value**[3]	**q-value**[4]
Sex					0.00	-0.31, 0.31		
Male	365 (100%)	99%, 100%	44 (100%)	90%, 100%				
Age	33 (29, 39)	34, 36	35 (30, 39)	33, 38	-0.51	-3.0, 2.0	0.7	>0.9
Lymphadenopathy	365 (100%)	99%, 100%	44 (100%)	90%, 100%	0.00%	0.00%, 0.00%		
Syphilis	35 (9.6%)	6.9%, 13%	1 (2.3%)	0.12%, 14%	7.3%	0.70%, 14%	0.2	>0.9
Sexually Transmitted Infections	106 (29%)	24%, 34%	10 (23%)	12%, 38%	6.3%	-8.2%, 21%	0.5	>0.9
Proctitis symptomatology	48 (13%)	9.9%, 17%	5 (11%)	4.3%, 25%	1.8%	-9.5%, 13%	>0.9	>0.9
Urethritis symptomatology	9 (2.5%)	1.2%, 4.8%	0 (0%)	0.00%, 10%	2.5%	-0.40%, 5.3%	0.6	>0.9
Sore throat symptomatology	365 (100%)	99%, 100%	44 (100%)	90%, 100%	0.00%	0.00%, 0.00%		

Characteristic	≥200 Cells/mm³, N = 365[1]	95% CI[2]	<200 Cells/mm³, N = 44[1]	95% CI[2]	Difference[3]	95% CI[23]	p-value[3]	q-value[4]
Psychological disturbances	4 (1.1%)	0.35%, 3.0%	0 (0%)	0.00%, 10%	1.1%	-1.1%, 3.3%	>0.9	>0.9
Skin lesions	365 (100%)	99%, 100%	44 (100%)	90%, 100%	0.00%	0.00%, 0.00%		
Respiratory symptoms	92 (25%)	21%, 30%	8 (18%)	8.7%, 33%	7.0%	-6.5%, 21%	0.4	>0.9
Musculoskeletal symptoms	107 (29%)	25%, 34%	9 (20%)	10%, 36%	8.9%	-5.2%, 23%	0.3	>0.9
Gastrointestinal symptoms	26 (7.1%)	4.8%, 10%	1 (2.3%)	0.12%, 14%	4.9%	-1.6%, 11%	0.4	>0.9

[1]n (%); Median (IQR)

[2]CI = Confidence Interval

[3]Standardized Mean Difference; Welch Two Sample t-test; 2-sample test for equality of proportions without continuity correction; Two sample test for equality of proportions

[4]False discovery rate correction for multiple testing

Discussion

Despite the global scope of the outbreak, establishing a clear epidemiological connection between cases in this study and the endemic region of the West mpox virus proved challenging, and it remains to be discovered.[4,6] The swift expansion of the outbreak and notable changes in epidemiology and clinical features added complexity to discerning direct connections.[7] As highlighted in this study, the characteristics of skin lesions, and its severity deviated from previous literature reports, underscoring the evolving nature of mpox in the current outbreak.[5,10,13] Additionally, buccal cavity and upper respiratory tract symptoms were more prevalent in this report than the one reported in the previous Colombian study.[14]

An intriguing finding in this study, consistent with other research, is the paramount significance of the sexual route, particularly among men who have sex with men, in driving the outbreak.[7,13,14] This aligns with studies indicating higher viral loads in genital lesions than in other body parts, notably the respiratory tract.[15,16]

Complications were not prevalent, although, in other series, cases involving anal receptive sex often necessitate pain-relieving medications. Commonly reported complications include proctitis, tonsillitis, paraphimosis, superinfections, and bacterial abscesses,[16,17] some of which were present in this study. The timeline for the appearance of crusts, along with reported symptoms such as fatigue, myalgia, headache, and sore throat, deviated from some literature reports, highlighting the uniqueness of the current outbreak.[5,6,8] Skin lesions and lymphadenopathy were reported in all patients, followed by mouth and upper respiratory tract symptomatology, indicating the systemic affectation of mpox disease and suggesting a relatively important presence of the mpox virus in mucosal tissues.[5,6,15-17]

The high proportion of PLWH in this study, as observed in other cohorts, suggests a broad sexual network, highlighting the need to enhance follow-up and STI diagnosis in this community.[17,18] Notably, the low mortality rate observed in this study is consistent with other reports, underscoring the relatively manageable nature of the IIb mpox infection outbreak. Concomitant STIs were detected in a notable percentage, including Syphilis, Gonococcal infections, Chlamydial infections, and herpes, aligning with similar findings in other reports,[17,18] albeit with minor variations in measured proportions in other studies and regions. As well, the proportion found in this paper differs from what was reported in the previous study conducted in Colombia, where only 10% of patients had concurrent STIs; however, similarly, Syphilis and Gonococcal infections were the most reported diseases.[4,6,8,17,18] Regarding HIV, more than half the individuals had a positive diagnosis, although the proportion of patients was smaller than those reported previously in other Colombian series.[14]

The findings regarding gastrointestinal symptoms of CD4 counts are particularly interesting. The increased proportion of individuals with gastrointestinal symptoms as the CD4 count rises may suggest a potential correlation between immune status and the manifestation of these symptoms, especially the possible improvement of MALT tissues.[20,21] This finding aligns with the general understanding of the immune system's role in maintaining gut health.[20,21] The comparison to patients without HIV provides context, highlighting that individuals with HIV may experience a distinct pattern of gastrointestinal symptoms influenced by their immunological status. Similarly, the higher prevalence of proctitis symptomatology in all CD4 groups compared to PWoH implies a potential link between immune compromise and an increased likelihood of proctitis.[20,21]

The observations related to urethritis symptoms across different CD4 counts add another layer to the complexity of the disease.[5,22,23,24] The higher prevalence of urethritis in certain CD4 groups might indicate variations in the manifestation of mpox infection based on immune status. This

warrants further investigation into how the virus interacts with the genitourinary system in individuals with different CD4 counts.[22]

The spread of the hMPXV has been suggested to be partly attributed to the lack of immunity to other Orthopoxviruses, particularly due to the absence of variolation, smallpox vaccination, and exposure to cowpox or horsepox.[25] In this cohort, no patients were vaccinated, emphasizing the potential role of vaccination in preventing the virus. Prevention strategies include live, nonreplicating, modified vaccines or the replication-competent smallpox vaccine.

The study reveals noteworthy distinctions in medication utilization and symptomatology between non-suppressed and suppressed populations, providing valuable insights into the clinical repercussions of HIV suppression.[22]

Turning to symptomatology, several marked differences were observed. The non-suppressed group demonstrated a higher prevalence of gastrointestinal symptoms (14% vs 6·7%), hypothesizing a potential link between incomplete viral suppression and gastrointestinal manifestations. Similarly, a notable disparity in the prevalence of muscle and bone symptoms was noted, with the non-suppressed group exhibiting a higher incidence (38·6% vs. 25·3%). This prompts further exploration into the impact of viral replication on musculoskeletal health.[22]

Psychological disorders were more prevalent in the non-suppressed group (1·7% vs. 0·5%), highlighting potential psychosocial implications associated with inadequate HIV control. Addressing mental health becomes crucial in the comprehensive care of individuals facing challenges in achieving viral suppression.[20,22]

Respiratory symptoms also showed a higher incidence in the non-suppressed group (35·1% vs. 22·3%), underscoring the complex impact of HIV replication on respiratory health. This finding calls for an in-depth examination of respiratory complications and tailored interventions for this subgroup.[20,22]

Urethritis symptoms were more pronounced in the non-suppressed group (5·2% vs. 2·5%), suggesting a potential association between incomplete viral suppression and genitourinary manifestations. Understanding the factors contributing to these symptoms is crucial for targeted clinical management.[20,22]

Lastly, the study highlighted a non-significant difference in the prevalence of syphilis and other STIs, as well as the differences in age groups are consistent with other literature reports of the current outbreak,[23,24] highlighting the interconnectedness of HIV control and the risk of acquiring

additional sexually transmitted infections as well as unknown sexual networks. This underscores the need for comprehensive sexual health strategies tailored to individuals facing challenges in achieving optimal HIV control.[21,22] Overall, these findings contribute to our understanding of the clinical implications of incomplete viral suppression and point out the importance of tailored interventions for individuals with suboptimal HIV control.[20,22]

However, certain limitations should be acknowledged in this study. The relatively confined geographic area from which patients were recruited may affect the generalizability of the findings to the entire country. Despite recruiting from some of the largest cities in Colombia, the participant institutions demonstrated heterogeneity in individual follow-up and baseline characteristic assessment methods, introducing limitations in outcome and variable measurements. The retrospective nature of this research and its focus on some Health institutions further limit the generalizability of the results to the broader population. On the positive side, the study's strengths lie in its substantial number of individuals and the diversity of regions covered, enabling the assessment of a wide array of individuals with different lifestyles. Additionally, using Case Report Forms (CRFs) proposed by the World Health Organization (WHO) provided a standardized approach to capturing patient data and biological variables. This setting enhances the reliability and consistency of the study's findings, contributing to the robustness of the research methodology. The usefulness of the clinical records promoted by WHO for diseases such as COVID or monkeypox demonstrates their usefulness for the clinical characterization and rapid detection of disease patterns as occurred in mpox. Now that the WHO has once again declared the mpox outbreak a public health emergency of international concern with the spread of new clades,[26] the rapid consolidation of clinical records allows us to understand whether there are indeed differences in forms of transmission, affected groups, clinical manifestations, lethality, etc., becomes important.

Conclusion

This study significantly enhances our comprehension of the Colombian mpox outbreak. The evidence presented, standardized using Case Report Forms (CRFs), and the comparison with findings from other studies underscore the importance of adopting an interdisciplinary approach in managing patients afflicted with mpox. Emphasis should be placed on comprehensive patient support and continuous follow-up, with a particular focus on detecting and addressing concomitant sexually transmitted infections (STIs). The integrated care model, as proposed by this study, is pivotal for providing holistic and effective management to individuals affected by

mpox, considering the evolving nature of the virus and its potential impact on various aspects of patient health.

Conflict of Interest

None to declare. The authors alone are responsible for the views expressed in this publication, and they do not necessarily represent the decisions or policies of the Pan American Health Organization or the World Health Organization

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