

What we need to know about Monkeypox in humans: facts, not fakes

Lo que necesitamos saber sobre la viruela del mono en humanos: hechos, no falsificaciones

O que precisamos saber sobre Monkeypox em humanos: fatos, não fakes

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Abstract

The aim was to provide scientific reflections based on concepts and evidence presented by studies published on the subject in the current year. This is an integrative review, carried out during the month of July 2022. The search led us to 15 articles selected for meeting the precepts of the research question established as a guide. Monkeypox is not a sexually transmitted infection, although it can be transmitted by close contact during sexual intercourse, when an active rash develops, regardless of the practitioners' sexual orientation. As with COVID-19, the use of masks, distancing and hand hygiene are ways to avoid contagion by monkeypox. Multimodal strategies, evidence-based discourses/publications, use of bundles and protocols, as well as articulations between academia, governments, services and civil society, should honor the diversity of compositions to strengthen actions and practices that preserve the autonomy of the individual and of society as a whole.

Descriptors: Health Education; Smallpox of Monkeys; Zoonosis; Communicable Disease; Nursing.

Resumen

El objetivo fue brindar reflexiones científicas basadas en conceptos y evidencias presentadas por estudios publicados sobre el tema en el año en curso. Esta es una revisión integradora, realizada durante el mes de julio de 2022. La búsqueda nos llevó a 15 artículos seleccionados por cumplir con los preceptos de la pregunta de investigación establecida como guía. La viruela del mono no es una infección de transmisión sexual, aunque puede transmitirse por contacto cercano durante las relaciones sexuales, cuando se desarrolla una erupción activa, independientemente de la orientación sexual de los practicantes. Al igual que con el COVID-19, el uso de mascarillas, el distanciamiento y la higiene de manos son formas de evitar el contagio de la viruela del simio. Las estrategias multimodales, los discursos/publicaciones basados en evidencia, el uso de paquetes y protocolos, así como las articulaciones entre academia, gobiernos, servicios y sociedad civil, deben honrar la diversidad de composiciones para fortalecer acciones y prácticas que preserven la autonomía del individuo y de la sociedad en su conjunto.

Descriptores: Educación para la Salud; Viruela de Monos; Zoonosis; Enfermedades Transmisibles; Enfermería.

Resumo

Objetivou-se propiciar reflexões científicas baseadas em conceitos e evidências apresentadas por estudos publicados sobre o assunto no ano vigente. Trata-se de uma revisão integrativa, realizada ao longo do mês de julho de 2022. A busca nos levou a 15 artigos selecionados por atenderem aos preceitos da pergunta de pesquisa estabelecida como guia. A varíola dos macacos não é uma infecção sexualmente transmissível, embora possa ser transmitida por contato próximo durante a relação sexual, quando uma erupção cutânea ativa se desenvolve, independente da opção sexual dos praticantes. Assim como na COVID-19, o uso de máscaras, o distanciamento e a higienização das mãos são formas de evitar o contágio pela varíola dos macacos. Estratégias multimodais, discursos/publicações baseadas em evidência, utilização de bundles e protocolos, bem como articulações entre a academia, governos, serviços e sociedade civil, devem prestigiar a diversidade de composições para o fortalecimento de ações e práticas que preservem a autonomia do indivíduo e da sociedade como um todo.

Descritores: Educação em Saúde; Varíola dos Macacos; Zoonose; Doença Transmissível; Enfermagem.



Introduction

The socio-epidemic history, particularly in the context of HIV/AIDS infection, but also of other diseases initially associated with specific groups (e.g. men who have sex with men - MSM, migrants, homeless people and prisoners), showed us that it is important to separate public health interventions, whether at the level of promoting healthy lifestyles or disease prevention, from the particular and/or behavioral characteristics of these groups, in order to avoid the formulation of prejudice and the constitution of the stigma. Anchored in the chronological historical facts of the epidemics, we question, therefore, if the current targeting of information on the Monkeypox outbreak to the MSM population may not contribute to a greater expression of cases in this population or, for example, to a delay in the diagnosis and the search for health care, given the fear of public hostility and/or institutional violence.

In this scenario, some aspects are still raised for reflection, mainly on the association of sexual orientation and practices with the process of transmission of the Monkeypox virus. In fact, a health researcher or educator should focus their statements on communication options that can prove to be more effective, such as highlighting the practice of sexual relations between infected individuals, without categorizing specific sexualities or practices, assuming a globalized position of sanitary actions and epidemiological control.

Otherwise, stigmatizing rhetoric can overlap the evidence-based response, fueling cycles of fear, which push away key groups that may be in vulnerable social contexts, such as health services. This fact can limit efforts to identify cases and encourage the adoption of ineffective punitive measures that may be crossed by stereotyped and conspiratorial formulations, which strengthen health misinformation.

Thus, the objective of this article is to provide scientific reflections based on concepts and evidence presented by studies published on the subject in the current year.

Methodology

This is an integrative review, which is based on a

broad synthesis of research related to the phenomenon of interest. The research was carried out in five stages: problem elaboration, literature search, data evaluation, data analysis and review presentation; according to the proposal and concepts of Whittemore and Knaf¹, in the first stage the guiding question of the research was formulated: “What is the approach of the literature on monkeypox as a current epidemic for humans?”.

For this purpose,, the PICO² research question model was used, “P” (population): humans, “I” (interest): contamination of humans by the Monkeypox virus, “Co” (context): from transmission to prevention. The search for studies took place during the month of July 2022, in Medical Literature Analysis and Retrieval System Online (Medline), Latin American and Caribbean Literature in Health Sciences (Lilacs), Spanish Bibliographic Index of Health Sciences (IBECs)) and Nursing Database (BDENF). The descriptors in Health Sciences (DeCS): “monkey pox” and “humans”, and their correspondents by the Medical Subject Heading (MeSH): “Monkeypox” AND “humans” were used in the searches for original research articles published in 2022 , in Portuguese, English or Spanish, whose complete and free texts were available electronically. For inclusion in the studies, they should deal with monkeypox in humans, and be primary original research.

The collected data were organized and interpreted with the elaboration of critical considerations on the subject under study. The information obtained was presented objectively, pointing out the results, implications and limitations of the study.

Regarding ethical aspects, the legitimacy of the information and authorship of the researched studies was ensured, citing and referencing them properly, according to the required standards, in accordance with the Copyright Law No. 9,610, of February 1998. As this is an integrative literature review, the approval of a Research Ethics Committee was not required.

Results and Discussion

The search for studies led us to 163 articles, of which 15 (Chart 1) were selected because they met the precepts of the research question established as a guide.

Chart 1. The selected studies. Rio de Janeiro, RJ, Brazil, 2022

Selected study	Study objective
Monkeypox goes global: why scientists are on alert	Alert the scientific community to the emergence of the virus in separate populations around the world, in places where it would not normally appear.
Exportation of Monkeypox Virus From the African Continent	Report the first confirmed human-to-human transmission event in the UK outside Africa.
Evidence of surface contamination in hospital rooms occupied by patients infected with Monkeypox, Germany, June 2022	Highlight the importance of strict adherence to recommended protective measures.
Ongoing Monkeypox virus outbreak, Portugal, 29 April to 23 May 2022	Evidence of identified varied forms of transmission, suggesting the possible previously undetected spread of monkeypox.
Guidelines for pregnant individuals with Monkeypox virus exposure	Report an emerging global outbreak of spider monkey virus infection, with documented community transmission among people in contact with symptomatic cases in non-endemic countries.



The Monkeypox virus	Report how animal-to-human transmission can initiate outbreaks, and person-to-person transmission can occur through contaminated objects.
Monkeypox virus infection: what dermatologist needs to know?	Present the main symptoms of monkeypox in humans.
Letter to the editor: multiple introductions of MPX in Italy from different geographic areas	Report the cases of Monkeypox that occurred in Italy.
Monkeypox could establish new reservoirs in animals	Present how Monkeypox could establish new reservoirs in animals.
Why monkeypox is mostly hitting men who have sex with men	Discuss aspects of why Monkeypox is being linked to men who have sex with men.
Global outbreak puts spotlight on neglected virus	Alert on global outbreak and put spotlight on neglected viruses.
The changing epidemiology of human monkeypox. A potential threat? A systematic review	Present a systematic review on the epidemiology of Monkeypox.
Shotgun metagenomic sequencing of the first case of monkeypox virus in Brazil, 2022	Present the endemic cases of Monkeypox in Africa.
Transmission of monkeypox virus through sexual contact - A novel route of infection	Discuss the transmission of Monkeypox by human-to-human sexual contact.
Directrices de laboratorio para la detección y el diagnóstico de la infección por el virus de la viruela del mono	Present guideline on identification and diagnosis of Monkeypox.

From the analysis and synthesis of the selected studies, the results were presented in four categories: conceptualization of Monkeypox, transmission of the disease to humans, symptomatology, treatment and prevention.

Conceptualization about Monkeypox

Monkeypox got its name from the fact that the virus was first discovered in monkeys in a Danish laboratory in 1958. The first human case was identified in a child in the Democratic Republic of Congo in 1970. The Monkeypox virus has two clades (strains): West Africa and Congo Basin (Central Africa). According to the World Health Organization (WHO), human infection from the West African clade appears to result in less severe disease compared to the Congo Basin clade, with a fatality rate of 3.6% compared to 10.6% for the Congo Basin clade. Countries where smallpox is endemic are Benin, Cameroon, Central African Republic, Democratic Republic of Congo, Gabon, Ghana (found only in animals), Côte d'Ivoire, Liberia, Nigeria, Republic of Congo, Sierra Leone and Sudan South³⁻⁵.

Therefore, monkeypox is not a sexually transmitted infection (STI), although it can be transmitted by close contact during sexual intercourse, when an active rash develops, regardless of the practitioners' sexual orientation. However, the disproportionate number of cases among the homosexual population, when compared to the number of cases among other men (in a larger population), led the WHO to issue specific recommendations for this population. Such recommendations, however, do not specifically address the sexual dimension of this group^{6,7}.

In a similar way, it happened with the first cases of

HIV/AIDS in the world, whose primary approach led to a process of severe stigmatization, still perceived today, even 40 years after its onset. In the course of this time, more questions have arisen about the balance between precise public health interventions aimed at those in need and exclusionary actions. In this line of reasoning, the apprehension of concepts outside a scientific context may divert efforts towards the increasing focus of monkeypox in community involvement across the country and the world.

A broad process of implantation and implementation of educational practices is needed, with a punctual and permanent scope, whose main purpose and benefit are the strengthening of dialogue and inclusive and protective communication strategies. The preservation of the individual and the collective must coexist harmoniously, not violating the human experience and its body. We emphasize here, particularly those that contradict cis-sexism and heterosexuality, which without the space for the exchange of ideas, perpetuate disinformation through coercive, dual, arbitrary, oppressive and sexist strategies⁸.

What we need to know about Monkeypox is that it is a viral zoonosis, a disease that has been spread between humans through a virus that spreads between animals. Before this outbreak, it occurred mainly in Central and West Africa, mainly in areas close to forests, as the hosts were rodents and monkeys. Cases of monkeypox will not stop appearing in countries where the disease is not endemic, most of them in Europe. In light of this, the WHO has been updating the number of cases, modes of transmission and symptoms associated with the common smallpox virus disease, which was eradicated from the world in 1980^{4,5,7-10}.



Disease transmission to humans

Monkeypox is transmitted by a virus belonging to the Poxviridae family of Orthopoxviruses and considered a viral zoonosis with symptoms similar to smallpox patients, but with less severe clinical symptoms. The incubation period for monkeypox is usually 6 to 13 days, but it can be as long as 5 to 21 days, according to the WHO^{11,12}.

Complications are more common in immunosuppressed patients. Severe conditions are related to the emergence of pneumonia, sepsis, encephalitis and eye infection, which can even lead to blindness¹²⁻¹⁴.

While in COVID-19 transmission occurs through the air through small suspended droplets (aerosols), in the case of monkeypox, what we know so far is that the disease-causing virus spreads through close contact with an infected person, transmitting the virus by the characteristic lesions on the skin or by droplets expelled by the respiratory system, as occurs in sneezing and coughing. Transmissibility therefore occurs through close contact with injuries, body fluids, respiratory droplets and contaminated materials such as bedding. Moreover, according to health agencies, human-to-human transmission is occurring between people in close physical contact with symptomatic cases.

Several animal species have been identified as susceptible to the monkeypox virus, but the natural history of the virus remains uncertain, especially the possible reservoirs and how its circulation is maintained in nature. Ingestion of undercooked meat and other animal products from infected animals is a possible risk factor, WHO indicates^{5,6,17}.

As with COVID-19, the use of masks, social distancing, airy environments with natural ventilation and hand hygiene are ways to avoid contagion by monkeypox. The National Health Surveillance Agency (Anvisa) reinforced the adoption of these measures, stressing that they also serve to protect against both diseases: COVID-19 and Monkeypox¹⁷.

Considering that initial data showed that the largest number of reported cases were concentrated in the group of people with the most active sexual practice, the WHO advised that this public should consider reducing, at this time, the number of sexual partners to reduce the risk of exposure^{17,18}.

Although health agencies are sharing, that one group in society is most affected right now, it is very important that we all understand that any of us are at risk.

Symptomatology

The most classic symptoms associated with monkeypox are: fever, headache and body aches, backache, chills, tiredness, skin sores (skin rashes) and swollen glands (which commonly precede the rash). Skin rashes go through different stages. They start out red and without volume, then gain volume and bubbles, before forming the husks. These sores are different from those seen in chickenpox, scabies, syphilis, herpes, and other diseases^{18,19}.

The WHO describes different symptom frames for suspected, probable and confirmed cases. Any person of any age who presents with acute and unexplained pustules

(blisters) on the skin and is in a country where monkeypox is not endemic is now considered a suspected case. If this condition is accompanied by headache, onset of fever above 38.5°C, swollen lymph nodes, muscle and body aches, back pain and profound weakness, an examination is necessary to confirm or rule out the disease¹⁶⁻¹⁸.

Cases considered "likely" include symptoms similar to suspected cases, such as physical skin-to-skin contact or with skin lesions, sexual contact or contact with contaminated materials 21 days before the onset of symptoms. In addition, travel history to an endemic country or having had close contact with possible infected people in the same period and/or having a positive serological test for orthopoxvirus in the absence of smallpox vaccination or other known exposure to orthopoxvirus^{17,18}.

Confirmed cases occur when there is laboratory evidence for monkeypox virus by real-time polymerase chain reaction (PCR) and/or sequencing^{17,18}.

Treatment and prevention

The diagnosis is usually confirmed by PCR (polymerase chain reaction) testing. There are currently no proven specific treatments for smallpox, but clinical symptoms can be controlled and prevention measures are in place. Antiviral drugs are being used to treat smallpox infection, but the indications are still being studied^{20,21}.

In addition, it is suggested that the smallpox vaccine can reduce the outbreak of the disease by up to 5-fold, according to a study in Congo, Africa²¹.

The disease usually resolves on its own (is self-limiting) and symptoms usually last 2 to 4 weeks. There are no specific treatments for monkeypox virus infections, according to the US Centers for Disease Control (CDC). However, the monkeypox virus and the smallpox virus are genetically similar, which means that drugs and vaccines to protect against smallpox can also be used to prevent and treat monkeypox²⁰⁻²².

The WHO advises that, in countries where there is community transmission of Monkeypox (the case of Brazil), actions to interrupt transmission should include targeted vaccination of people at high risk of exposure to the disease. These groups include: gay, bisexual, and other men who have sex with men (MSM), healthcare workers dealing with suspected or confirmed cases, some laboratory workers, and people who have sex with multiple partners. There is still no vaccine available in Brazil: the Ministry of Health reported that it "articulates with the WHO the negotiations for the acquisition of the monkeypox vaccine". The WHO says the risks and benefits of targeted vaccination should also be assessed for vulnerable groups such as immunosuppressed people, children and pregnant women²²⁻²⁴.

Final Considerations

Multimodal strategies, evidence-based discourses/publications, use of bundles and protocols, as well as articulations between academia, governments, services and civil society, should honor the diversity of compositions to strengthen actions and practices that preserve the autonomy of the individual and of society as a



whole. These prerogatives, combined with health promotion and prevention practices, need to coexist in a transparent way. Only with planning, science and the participation of society can we minimize the deleterious effects already experienced in previous and current epidemics and pandemics, such as in the case of HIV/AIDS and COVID-19 infection.

É I need to invest in research, action time and prompt responses at the height and speed that every catastrophe demands. Thus, using successful experiences, as we are still experiencing in the COVID-19 pandemic, can be a way to mitigate new cases of Monkeypox in Brazil. Vaccination against monkeypox should be implemented as soon as possible, in a widespread manner, to reduce

opportunities for viral mutation and the spread of smallpox among humans on a large scale. Local containment measures, to prevent worldwide transmission, must be a serious government action throughout the national territory.

Quality information must be widely disseminated to improve the recognition of the disease, credibility of scientific recommendations and break with claims of a purely unconstitutional nature to human rights.

We need broad support for research centers so that they have easy access to diagnostic tools to assess the current situation, collect data and produce the means of vaccine protection.

References

1. Whittemore R, Knafl K. The integrative review: updated methodology. *J Adv Nurs*. 2005 Dec;52(5):546-53. doi: 10.1111/j.1365-2648.2005.03621.x
2. Pinkstone J. Grindr sends monkeypox warnings to users as cases rise. *The Telegraph* [Internet]. 2022 [acesso em 25 set 2022]. Disponível em: <https://www.telegraph.co.uk/news/2022/05/25/grindr-sends-monkeypox-warnings-users-cases-continue-soar/#:~:text=Grindr%2C%20the%20dating%20app%2C%20has,among%20gay%20and%20bisexual%20men>.
3. World Health Organization (WHO). Monkeypox: key facts [Internet]. Geneva: WHO; 2022 [acesso em 25 set 2022]. Disponível em: <https://www.who.int/news-room/fact-sheets/detail/monkeypox>
4. World Health Organization (WHO). Monkeypox: public health advice for gay, bisexual and other men who have sex with men [Internet]. Geneva: WHO; 2022 [acesso em 25 set 2022]. Disponível em: <https://www.who.int/news/item/25-05-2022-monkeypox--public-health-advice-for-gay--bisexual-and-other-men-who-have-sex-with-men>
5. World Health Organization (WHO). Multi-country monkeypox outbreak in non-endemic countries: update [Internet]. Geneva: WHO; 2022 [acesso em 25 set 2022]. Disponível em: <https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON388>
6. Bellinato F, Gisondi P, Girolomoni G. Monkeypox virus infection: what dermatologist needs to know? *J Eur Acad Dermatol Venereol*. 2022;36(8):e656-e658. doi: 10.1111/jdv.18299
7. Bunge EM, Hoet B, Chen L, Lienert F, Weidenthaler H, Baer LR, Steffen R. The changing epidemiology of human monkeypox-A potential threat? A systematic review. *PLoS Negl Trop Dis*. 2022;16(2): e0010141. <https://doi.org/10.1371/journal.pntd.0010141>
8. Cohen J. Monkeypox could establish new reservoirs in animals. *Science*. 2022;376(6599):1258-1259. doi: 10.1126/science.add4868
9. Claro IM, Romano CM, Candido DS, Lima EL, Lindoso JAL, Ramundo MS, Moreira FRR, Barra LAC, Borges LMS, Medeiros LA, Tomishige MYS, Moutinho T, Silva AJD, Rodrigues CCM, Azevedo LCF, Villas-Boas LS, Silva CAM, Coletti TM, et al. Shotgun metagenomic sequencing of the first case of monkeypox virus in Brazil, 2022. *Rev Inst Med Trop Sao Paulo*. 2022;64:e48. <https://doi.org/10.1590/S1678-9946202264048>
10. Cohen J. Global outbreak puts spotlight on neglected virus. *Science*. 2022;376(6597):1032-1033. doi: 10.1126/science.add2701
11. Heskin J, Belfield A, Milne C, Brown N, Walters Y, Scott C, Bracchi M, Moore LSP, Mughal N, Rampling T, Winston A, Nelson M, Duncan S, Jones R, Price DA, Mora-Peris B. Transmission of monkeypox virus through sexual contact. A novel route of infection. *J Infect*. 2022;85(3):334-363. doi: 10.1016/j.jinf.2022.05.028
12. Mauldin MR, McCollum AM, Nakazawa YJ, Mandra A, Whitehouse ER, Davidson W, Zhao H, Gao J, Li Y, Doty J, Yinka-Ogunleye A, Akinpelu A, Aruna O, et al. Exportation of Monkeypox Virus from the African Continent. *J Infect Dis*. 2022;225(8):1367-1376. doi: 10.1093/infdis/jiaa559
13. Kozlov M. Monkeypox goes global: why scientists are on alert. *Nature*. 2022;606(7912):15-16. doi: 10.1038/d41586-022-01421-8
14. Dashraath P, Nielsen-Saines K, Mattar C, Musso D, Tambyah P, Baud D. Guidelines for pregnant individuals with monkeypox virus exposure. *Lancet*. 2022;400(10345):21-22. [https://doi.org/10.1016/S0140-6736\(22\)01063-7](https://doi.org/10.1016/S0140-6736(22)01063-7)
15. European Centre for Disease Prevention and Control (ECDC). Hepatitis A outbreaks in the EU/EEA mostly affecting men who have sex with men [Internet]. ECDC: 2018 [acesso em 25 set 2022]. Disponível em: <https://www.ecdc.europa.eu/en/news-events/epidemiological-update-hepatitis-outbreak-eueea-mostly-affecting-men-who-have-sex-men-2>
16. Ferraro F, Caraglia A, Rapiti A, Cereda D, Vairo F, Mattei G, Maraglino F, Rezza G. Letter to the editor: multiple introductions of MPX in Italy from different geographic areas. *Euro Surveill*. 2022;27(23). doi: 10.2807/1560-7917.ES.2022.27.23.2200456.
17. Sousa AR, Cerqueira SSB, Santana TS, Suto CSS, Almeida ES, Brito LS, et al. Estigma vivenciado por homens diagnosticados com COVID-19. *Rev Bras Enferm*. 2022;75(Suppl 1). <https://doi.org/10.1590/0034-7167-2021-0038>
18. UNAIDS. Press Release: UNAIDS warns that stigmatizing language on Monkeypox jeopardises public health [Internet]. UNAIDS; 2022 [acesso em 25 set 2022]. Disponível em: https://www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2022/may/20220522_PR_Monkeypox
19. Halani S, Mishra S, Bogoch II. The monkeypox virus. *CMAJ*. 2020;194(24):E844. doi: 10.1503/cmaj.220795
20. Organización Panamericana de la Salud (OPAS). Directrices de laboratorio para la detección y el diagnóstico de la infección por el virus de la viruela del mono - Laboratory Guidelines for the Detection and Diagnosis of Monkeypox Virus Infection. Washington; OPS; 2022.



21. Nörz D, Pfefferle S, Brehm TT, Franke G, Grewe I, Knobling B, Aepfelbacher M, Huber S, Klupp EM, et al. Evidence of surface contamination in hospital rooms occupied by patients infected with monkeypox, Germany, June 2022. *Euro Surveill.* 2022;27(26). doi: 10.2807/1560-7917.ES.2022.27.26.2200477
22. Kupferschmidt K. Why monkeypox is mostly hitting men who have sex with men. *Science* [Internet]. 2022 [acesso em 25 set 2022];376(6600):1364-1365. Disponível em: <https://www.science.org/content/article/why-the-monkeypox-outbreak-is-mostly-affecting-men-who-have-sex-with-men?cookieSet=1>
23. Duque MP, Ribeiro S, Martins JV, Casaca P, Leite PP, Tavares M, Mansinho K, Duque LM, Fernandes C, Cordeiro R, Borrego MJ, Pelerito A, Carvalho IL, et al. Ongoing monkeypox virus outbreak, Portugal, 29 April to 23 May 2022. *Euro Surveill.* 2022;27(22). doi: 10.2807/1560-7917.ES.2022.27.22.2200424
24. Boing AC, Donalísio MR, Araújo TM, Muraro AP, Orellana JDY, Maciel EL, Comissão de Epidemiologia da Associação Brasileira de Saúde Coletiva (ABRASCO). Monkeypox: o que estamos esperando para agir? (O preprint foi submetido para publicação em um periódico em 01-08-2022).