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Research Article

MONKEY POX: A NOVEL UNRAVELLING OF INTERCONTINENTAL HEALTHEMERGENCY?

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A R T I C L E I N F O

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A B S T R A C T

"Monkeypox" is a misnomer. As the Universe is an illusory convalescence from Covid-19 and it's not over yet, additional viruses have striked on our doors. Monkey pox (MPX) is a viral zoonotic disease .The virus was discovered in 1958 in research monkeys, but its natural hosts are likely rodents and other small mammals. An emerging viral zoonosis Human monkeypox was first recognized in Africa. Cases of human monkeypox are rarely seen outside of west and central Africa. Monkeypox virus infection has been detected in squirrels, Gambian pouched rats, dormice, and some species of monkeys. Cases of monkeypox virus, which started in the United Kingdom, have now been confirmed in more than 12 countries. Initially, skin eruptions appear followed by fever with diaphoresis and rigors. Skin lesions progress from papules to vesiculopustular to resolving eschars. The lesions histologically appear as ballooning degeneration of basal keratinocytes, spongiosis of a mildly acanthotic epidermis progressing to full thickness necrosis of a markedly acanthotic epidermis with few viable keratinocytes.

INTRODUCTION

Eradicating smallpox and subsequent lack of vaccination efforts paved the way for monkeypox to gain clinical relevance.(1) Monkeypox occur in rural Africa, suspected underreporting may translate to an underestimation of the potential threat of this pathogen (2)

Poxviruses are brick-shaped, surrounded by a lipoprotein envelope with a linear double-stranded DNA genome. (3,4) Aside from their reliance on host ribosomes for mRNA translation, poxviruses include all necessary replication, transcription, assembly, and egress proteins in their genome.(5) The total number of lesions may vary from a small amount to thousands.(6) Patients are no longer considered infectious after all crusts fall off.(7)

Clinical illnesses increases, as is the case with chickenpox, given the lack of routine varicella-zoster vaccination in Africa.(8) Diagnosis can be confirmed by testing a lesion for the virus's DNA (9) The disease can appear similar to chickenpox (10) The smallpox vaccine can prevent infection with 85% effectiveness (11) Complications include secondary infections, pneumonia, sepsis, encephalitis, and loss of vision if severe eye infection (12) Immunity to monkeypox virus was previously achieved with vaccinia vaccination (13)

The antivirals cidofovir and tecovirimat can be used to control outbreaks. (14) Poxviruses are brick-shaped, surrounded by a

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lipoprotein envelope with a linear double-stranded DNA genome. (15) Although human-to-human transmission has previously been limited, mathematical modeling in the context of decreasing herd immunity to orthopoxviruses reflects an increasing threat of disease spread between humans (16) Lesions start in the oropharynx then appear on the skin. Serum antibodies are often detectable by the time lesions appear (17) The disease has always been considered rare and self-limiting, however recent sporadic reports suggest otherwise (18)

Lesions start in the oropharynx then appear on the skin. Serum antibodies are often detectable by the time lesions appear.(19) Viral cytopathic effect manifested as multinucleated syncytial keratinocytes. Immunohistochemically, viral antigen is detected within keratinocytes of the lesional epidermis, follicular and eccrine epithelium and few dermal mononuclear cells. (20)

History

Historical clues for monkeypox infection such as recent travel to endemic areas, interaction with wild animals imported from endemic areas, and providing care to an infected animal or human help build a differential diagnosis, but clinical features are critical.

Monkeypox was first identified in laboratory cynomolgus monkeys in Denmark, by Preben von Magnus in 1958, when two outbreaks of a smallpox-like disease occurred in colonies of monkeys captured in Malaysia, and transported via Singapore (21) An outbreak of monkeypox at Rotterdam Zoo was reported in 1964.Subsequently monkeypox was detected in several laboratory monkeys in the US (22)

No further cases in laboratory monkeys occurred after 1968 as conditions for monkeys improved and the requirement for monkeys, used mainly for producing the polio vaccine, from Asia and Africa fell. The virus was never found in Asia, and the occurrence in Asian monkeys was likely due to contracting the disease in captivity and transit, or contamination (23) The first documented case in humans was in 1970, in an unvaccinated 9-month old boy in the Équateur Province Democratic Republic of the Congo (formerly Zaire) (24)

Almost 50 cases were reported between 1970 and 1979, with more than two thirds of these being from Zaire. The other cases originated from Liberia, Nigeria, Ivory Coast and Sierra Leone (25)

By 1986, over 400 cases in humans were reported. Small viral outbreaks with a death rate in the range of 10% and a secondary human-to-human infection rate of about the same amount occur routinely in equatorial Central and West Africa (26)

Differences between Monkeypox and small pox

How did the current outbreaks start?

One of the most important insights they have gained is that each of the sequences closely resembles that of a monkeypox strain found in West Africa. The strain has a death rate of less than 1% in poor, rural populations, making it much less lethal than another that has been detected in Central Africa. That one has a fatality rate of up to 10%. (27)

Monkeypox goes global

A s Nature went to press, almost 600 confirmed or suspected cases of monkeypox, a rare viral disease seldom detected outside Africa, had been reported in at least 30 nonAfrican countries in the course of a few weeks.

The virus is called monkeypox because researchers first detected it in laboratory monkeys in 1958, but it is thought to transmit to people from wild animals such as rodents, or from other infected people. (28)

Monkeypox Virus Structure

The monkeypox virus hails from the Orthopoxvirus genus in the Poxviridae family, which also includes the viruses that cause smallpox and cowpox. Like all poxviruses, monkeypox virions are large, enveloped and "brickshaped.

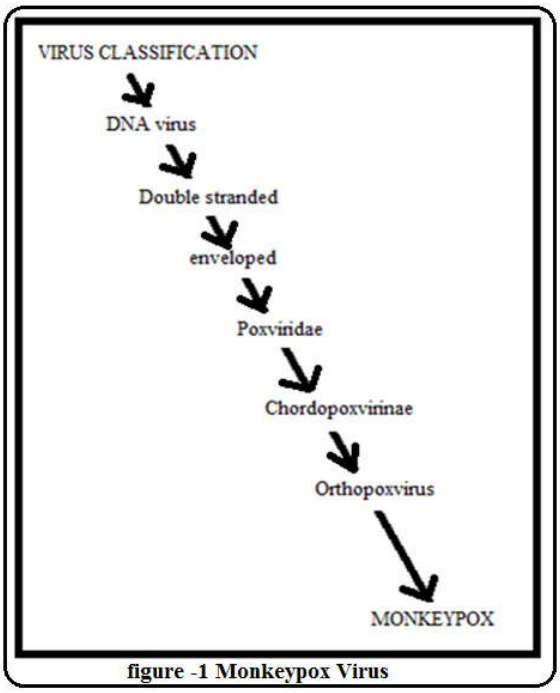

figure -1 Monkeypox Virus

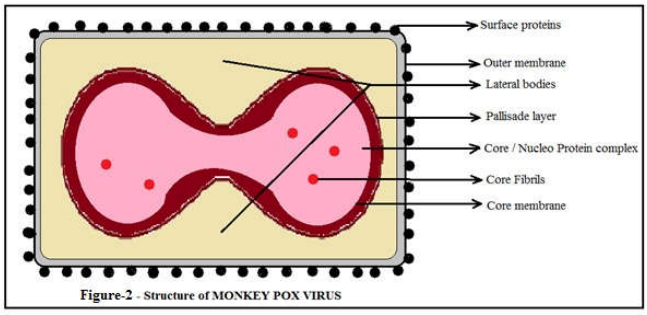

Figure-2 - Structure of MONKEY POX VIRUS

Replication

The monkeypox replication occurs at the inoculation site after entering via any channel (oropharynx, nasopharynx, or intradermal). It subsequently travels to local lymph nodes. Following then, viral propagation and planting of other organs occurs as a result of an initial viremia. This is the incubation period, which can last anywhere from 7 to 14 days with a maximum of 21 days.

"Encapsulated within each virion is a core containing a linear, double-stranded DNA genome and enzymes required for virus uncoating and replication. At the onset of infection, poxvirus

particles attach to the host cell membrane through various viral host protein interactions.

Each infectious particle gives rise to a single factory, which forms from virus-mediated remodeling of the host rough endoplasmic reticulum (ER). (29)

Clinical features of Monkeypox

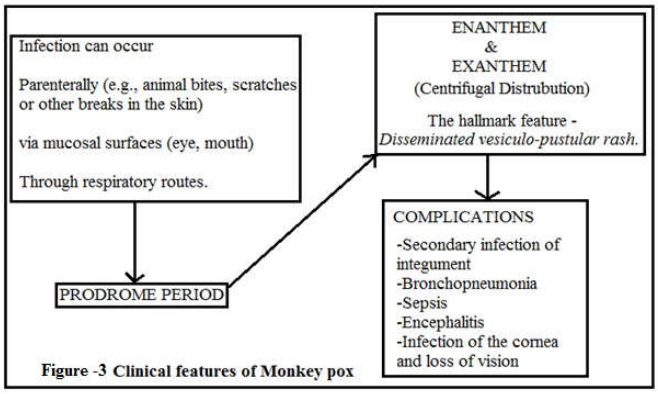

Figure -3 Clinical features of Monkey pox

Monkey Pox	vs	Small Pox
Prominent Lymphadenopathy		No
Greater Significant Parenteral mode of transmission		Inter human transmission - five fold higher efficiency

Figure- 4 Important differences

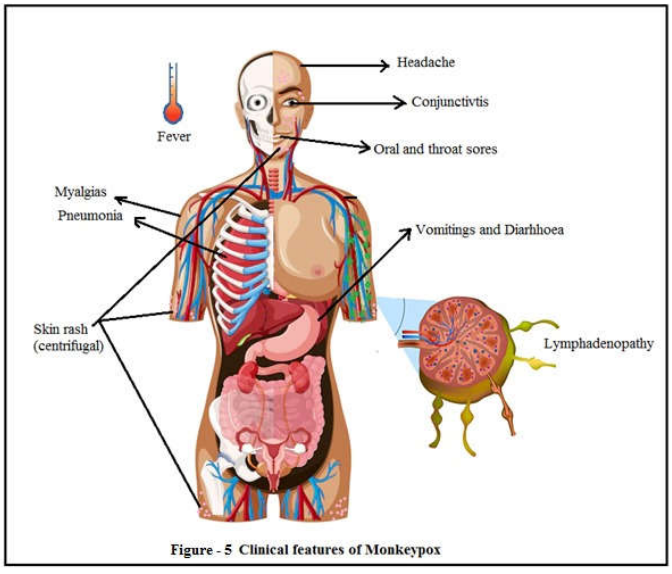

Figure - 5 Clinical features of Monkeypox

How is it spreading?

Transmission between people mostly occurs through large respiratory droplets, normally meaning prolonged contact face to face. But the virus can also spread through bodily fluids. The latest cases have mainly been among men who have sex with men. The UK Health Security Agency said that, although monkeypox has not previously been described as a sexually transmitted infection, it can be passed on by direct contact during sex. It can also be passed on through other close contact with a person who has monkeypox or contact with clothing or linens used by a person who has monkeypox (30)

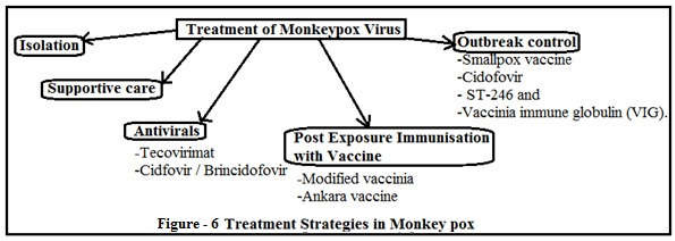

Figure - 6 Treatment Strategies in Monkey pox

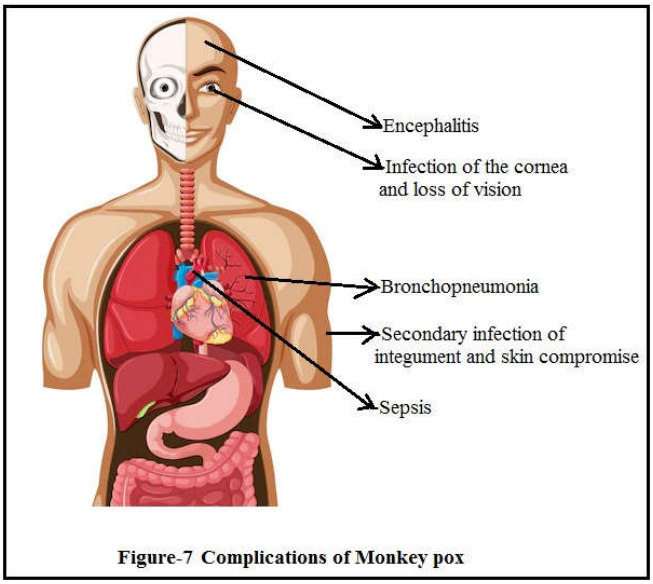

Figure-7 Complications of Monkey pox

What are the symptoms?

Symptoms can include fever, headache, muscle aches, backache, swollen lymph nodes, chills, and exhaustion. Typically a rash will develop, which often starts on the face but can then spread to other areas such as the genitals. The rash will go through different stages before forming a scab that finally falls off.

The lesions progress through macules, papules, vesicules, and pustular stages during the next 3 to 4 weeks with increments. Lesions are hard, deep, and 1 to 9 mm in size, and they alter synchronously. Before crusts form, lesions are in the pustular stage for 5 to 7 days. Crusts develop and desquamate over the next 7 to 14 days, and in most cases, the condition cures three to four weeks following symptom beginning. After all crusts have fallen off, the patient is no longer considered contagious

Differential Diagnosis

Smallpox Generalized vaccinia Disseminated zoster Chickenpox Eczema herpeticum Disseminated herpes simplex Syphilis Yaws Scabies Rickettsialpox Measles Bacterial skin infections Drug-associated eruption (31,32)

MA NDB Meet on "How viruses work? Is monkeypox the next big thing? Intractable cough…how to treat it?"

Speaker: DrNidhiDhawanMay 29, 2022, Sunday There have been several outbreaks in the past recorded history, which have largely been restricted to geographical areas because traveling was not so prevalent as it is now.(33)

As global monkeypox case count spikes, US procures more vaccine

As, a precautionary measure and to handle emergency situations, the U.S. government is procuring more monkeypox

vaccines. The US had documented 45 cases as of Friday in 15 states and the District of Columbia. More than 1,300 cases have been detected in around 30 additional countries.In the United States, Jynneos, a two-dose vaccination for monkeypox, has been authorized.

Monkeypox spreads only through air and face-to-face contact

In a briefing on Friday, CDC chief Rochelle Walensky said monkeypox was being passed on through physical contact with symptomatic patients and by touching their clothing and bedding, reports the Daily Mail.

"The disease is not spread through casual conversations, passing others in a grocery store, or touching things like door knobs," she said."All of the cases we have seen to date in this outbreak have been related to direct contact."During the conference health officials also called on Americans with any sexually transmitted infection, including syphilis, gonorrhea and chlamydia, to get tested for monkeypox. They warned many patients were experiencing rashes and sores on the genitals and anus that looked like STIs.

Outbreaks

First case of monkeypox was confirmed in a Nigerian person on May 7 in the U.K. The virus has spread to at least 21 countries and infected 226 people**,** predominantly, in North America and Europe. May 26. In the UK,106 laboratories reported confirmed MPX cases. In Canada, a patient had symptoms of monkeypox on April 29, but was not tested at that time All the 21 countries that have reported at least one case are non-endemic for monkeypox. In Spain and Belgium countries, two rave parties have spread high incidence of infection rates.231 confirmed cases were reported in Nigeria, and eight deaths since 2017, with 15 cases reported this year till April 30.

However, human-to-human transmission in non-endemic countries has been very limited, if at all, in the past. Despite the first case in humans being reported in 1970, and the virus becoming endemic in about a dozen countries in Africa, very little attention has been paid to study the virus characteristics, the host animal, and the modes of transmission.

Nigeria Records First Death Due To Monkeypox

Monkeypox in Congo in 2022 while in West and Central Africa, where Nigeria has recorded its first death the disease is endemic. from the disease this year, the countries' health authorities said, even as at least 20 countries continue to grap- dead monkeys and rodents, Dr. Alon- cy said Sunday ple with sudden outbreakS not seen go said. "The residents enter the forin years. Dr. AimeAlongo, chief of the bats and rodents, Sankuru health division in Congo, voirs of monkeypox," the official Nigeria, meanwhile, recorded its first death from monkey pox this year.

Genome sequencing

According to Dr. Scaria, besides providing insights into emergence, genetic epidemiology helps in understanding evolution through surveillance and line-trace contact networks. "The former is still applicable, while even with the loss of resolution, the latter is still useful," he says.

Low mutation rate

Till date over JS monkeypox genomes have been sequenced. But the monkeypox virus has a lower mutation rate (about two mutations a year) compared to nearly 25 mutations .!n a year in the case of SARSCoV-2 virus. This is because monkeypox is a DNA virus unlike the SARS-CoV-2, which is an RNA .virus. The low mutation rate in DNA viruses is largely due to the differences in mechanisms which creaie the mutation· as also proof-reading mechanisms utilized by the viruses. "The mutation rates of monkeypox are not weU known, but generally other pox viruses have a much lower mutation rate. But almost all outbreaks have been due to spillovers from animals,

How did the current outbreaks start?

One of the most important insights they have gained is that each of the sequences closely resembles that of a monkeypox strain found in West Africa. The strain has a death rate of less than 1% in poor, rural populations, making it much less lethal than another that has been detected in Central Africa.

.Monkeypox genomes are at least "six times harder to analyze", says Rachel Roper, a virologist at East Carolina University in Greenville, North Carolina.

WHO to change monkey pox virus name as scientists call it "discriminatory"

A WHO spokesperson said that the process of naming diseases should be "done with the aim to minimize the negative impact" and avoid offending any "cultural, social, national, regional, professional or ethnic groups."

Monkey pox confirmed cases rise to 1600,WHO calls emergency meet

The World Health Organization (WHO) on Tuesday (June 14, 2022) said that the total number of confirmed cases of monkeypox has increased to 1,600 globally and that it has called an emergency meeting to assess if the "unusual" and "concerning" outbreak is an international health emergency. While addressing a media briefing in Geneva, WHO Chief TedrosAdhanomGhebreyesus informed that so far this year, more than 1,600 confirmed cases and almost 1,500 suspected cases of monkeypox disease have been reported to WHO from 39 countries – including seven countries where monkeypox has been detected for years, and 32 newly-affected countries.

He added that 72 deaths linked to the monkeypox virus have been so far reported from previously-affected countries in 2022. No deaths, however, have been recorded to date from the newly-affected countries, "although WHO is seeking to verify news reports from Brazil of a monkeypox-related death there", Tedros said.

Treatment of Monkey pox

Although there are no precise therapies for monkeypox infection at present time, breakouts can be controlled. A monkeypox outbreak can be controlled with smallpox vaccine, cidofovir, ST-246, and vaccinia immune globulin (VIG). The latest public evidence about the benefits and dangers of smallpox vaccination and medicine use for the care and mitigation of monkeypox as well as other orthopoxvirus infections was used to establish WHO guidance.

In the USA, a vaccine has been approved to prevent monkeypox and smallpox. Because the virus that causes monkeypox is closely linked to the infectious agent smallpox, the smallpox vaccine could also protect people from monkeypox. Smallpox vaccine is at least 83.5 percent effective in preventing monkeypox, according to evidence from Africa. A clinical investigation on the immunology of this vaccine and efficiency data from animal studies were used to determine the efficacy against monkeypox. Vaccination following a monkeypox encounter, according to experts, may help prevent or lessen the severity of the disease. ACAM2000, which includes a live vaccinia virus, is approved for use in adults over the age of 17 who are at high risk of contracting smallpox. If administered under an expanded access experimental medication procedure, it can be used in patients who have been exposed to monkeypox. A set of do's and dont's should be taken to avoid infection with the monkeypox virus.

Infection prevention and control

Vaccinationagainst smallpox is assumed to provide protection against human monkeypox infection (34)

Routine smallpox vaccination was discontinued following the eradication of smallpox (35)

Smallpox vaccine has been reported to reduce the risk of monkeypox among previously vaccinated persons in Africa. The decrease in immunity to poxviruses in exposed populations is a factor in the prevalence of monkeypox. It is attributed both to waning cross-protective immunity among those vaccinated before 1980 when mass smallpox vaccinations were discontinued, and to the gradually increasing proportion of unvaccinated individuals (36)

Clinical management

One has to avoid a close contact with animals that may have been infected with the virus (which categorizes living organisms that have been sick or that have died in regions where monkeypox is prevalant). Avoid touching any objects that have made contact with a clinically infected animals.
One has to separate infectious patients from those who are clinically healthy

CONCLUSION

MPXV is named due to its initial detection in monkeys. MPXV can primarily be found in rodents. Swollen lymph nodes are typical of monkeypox. However, lesions may be coalesce into large bullae. Positive detection using an OPXV PCR assay followed by confirmation of MPXV via PCR and/or sequencing, or positive detection using MPXV PCR assay in suspected cases in endemic and non-endemic areas indicates confirmation of MPXV infection. According to the CDC, vaccination within three days of exposure may prevent disease onset, whereas vaccination within two weeks may reduce disease severity

References

1. Nguyen PY, Ajisegiri WS, Costantino V, Chughtai AA, MacIntyre CR. Reemergence of Human Monkeypox and Declining Population Immunity in the Context of Urbanization, Nigeria, 2017-2020. Emerg Infect Dis. 2021 Apr;27
2. PMC free article: PMC8007331] [PubMed: 33756100] Sklenovská N, Van Ranst M. Emergence of Monkeypox as the Most Important Orthopoxvirus Infection in Humans. Front Public Health. 2018;6:241. [PMC free article: PMC6131633] [PubMed: 30234087]
3. Alakunle E, Moens U, Nchinda G, Okeke MI. Monkeypox Virus in Nigeria: Infection Biology, Epidemiology, and Evolution. Viruses. 2020 Nov 05;12(11) [PMC free article: PMC7694534] [PubMed: 3316749
4. Kugelman JR, Johnston SC, Mulembakani PM, Kisalu N, Lee MS, Koroleva G, McCarthy SE, Gestole MC, Wolfe ND, Fair JN, Schneider BS, Wright LL, Huggins J, Whitehouse CA, Wemakoy EO, Muyembe-Tamfum JJ, Hensley LE, Palacios GF, Rimoin AW. Genomic variability of monkeypox virus among humans, Democratic Republic of the Congo.Emerg Infect Dis. 2014 Feb;20(2):232-9.
5. Walsh D. Poxviruses: Slipping and sliding through transcription and translation. PLoSPathog. 2017 Nov;13(11):e1006634.
6. McCollum AM, Damon IK. Human monkeypox.Clin Infect Dis. 2014 Jan;58(2):260-7. [PubMed: 241584
7. Weaver JR, Isaacs SN. Monkeypox virus and insights into its immunomodulatory proteins.Immunol Rev. 2008 Oct;225:96-113.
8. Hussey HS, Abdullahi LH, Collins JE, Muloiwa R, Hussey GD, Kagina BM. Varicella zoster virus-associated morbidity and mortality in Africa: a systematic review protocol. BMJ Open. 2016 Apr 20;6
9. "2003 U.S. Outbreak Monkeypox". *CDC*. 11 May 2015. Archived from the original on 15 October 2017.Retrieved 15 October 2017.
10. McCollum AM, Damon IK (January 2014). "Human monkeypox". *Clinical Infectious Diseases*. **58** (2): 260–267
11. "Treatment | Monkeypox | Poxvirus | CDC". *www.cdc.gov*. 2021-07-18. Archived from the original on 2019-06-15.Retrieved 2022-05-18.
12. "Monkeypox". *www.who.int*. World Health Organization. Retrieved 22 May 2022.
13. Nguyen PY, Ajisegiri WS, Costantino V, Chughtai AA, MacIntyre CR. Reemergence of Human Monkeypox and Declining Population Immunity in the Context of Urbanization, Nigeria, 2017-2020. Emerg Infect Dis. 2021 Apr;27(4) [PMC free article]
14. UK Health Security Agency. Monkeypox. https://www.gov.uk/guidance/monkeypox#treatment
15. Alakunle E, Moens U, Nchinda G, Okeke MI. Monkeypox Virus in Nigeria: Infection Biology, Epidemiology, and Evolution. Viruses. 2020 Nov 05;12(11)
16. Grant R, Nguyen LL, Breban R. Modelling human-to-human transmission of monkeypox. Bull World Health Organ. 2020 Sep 01;98(9):638-640.
17. Hutson CL, Carroll DS, Gallardo-Romero N, Drew C, Zaki SR, Nagy T, Hughes C, Olson VA, Sanders J, Patel N, Smith SK, Keckler MS, Karem K, Damon IK. Comparison of Monkeypox Virus Clade Kinetics and Pathology within the Prairie Dog Animal Model Using a Serial Sacrifice Study Design. Biomed Res Int. 2015;2015:965710.
18. Moore M, Zahra F. Monkeypox. [Updated 2022 May 22]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-.

19. Hutson CL, Carroll DS, Gallardo-Romero N, Drew C, Zaki SR, Nagy T, Hughes C, Olson VA, Sanders J, Patel N, Smith SK, Keckler MS, Karem K, Damon IK. Comparison of Monkeypox Virus Clade Kinetics and Pathology within the Prairie Dog Animal Model Using a Serial Sacrifice Study Design. Biomed Res Int. 2015;2015:965710.]
20. Monkeypox virus: Histologic, immunohistochemical and electron-microscopic findings February 2005, Journal of Cutaneous Pathology 32(1):28-34
21. Fenner, Frank; Wittek, Riccardo; Dumbell, Keith R. (1988)."1. Historical introduction and overview". *The Orthopoxviruses*. Elsevier. pp. 11–12. ISBN 978-0-323-15022-4
22. Cho, C. T.; Wenner, H. A. (March 1973). "Monkeypox virus". *Bacteriological Reviews*. **37** (1): 1–18. doi:10.1128/br.37.1.1-18.1973. ISSN 0005-3678.
23. *Fenner, Frank; Wittek, Riccardo; Dumbell, Keith R. (1988). "8. Monkeypox virus". The Orthopoxviruses. Elsevier. pp. 227–267. Retrieved 2022-05-26*
24. Bunge, Eveline M.; Hoet, Bernard; Chen, Liddy; Lienert, Florian; Weidenthaler, Heinz; Baer, Lorraine R.; Steffen, Robert (11 February 2022). "The changing epidemiology of human monkeypox—A potential threat?A systematic review". *PLOS Neglected Tropical Diseases*. **16** (2): e0010141
25. Breman JG, Steniowski MV, Zanotto E, Gromyko AI, Arita I (1980). "Human monkeypox, 1970–79". *Bulletin of the World Health Organization*. **58** (2): 165–182.
26. Meyer H, Perrichot M, Stemmler M, Emmerich P, Schmitz H, Varaine F, et al. (August 2002). "Outbreaks of disease suspected of being due to human monkeypox virus infection in the Democratic Republic of Congo in 2001". *Journal of Clinical Microbiology*. **40** (8): 2919–2921
27. News in focus,| springer Nature | Vol 606 | 9 June 2022
28. Max Kozlov, MONKEYPOX GOES GLOBAL: WHY SCIENTISTS ARE ON THE ALERT, Nature | Vol 606 | 2 June 2022
29. Madeline Barron,Rodney Rohde, Monkeypox: What We Do and Don't Know About Recent Outbreaks, American Society Microbiology Ma y 2 4 , 2 0 2 2
30. Elisabeth Mahase, Monkeypox: What do we know about the outbreaks in Europe and North America?, BMJ 2022; 377 doi: https://doi.org/10.1136/bmj.o1274 (Published 20 May 2022) Cite this as: BMJ 2022;377:o1274
31. Monkeypox. WklyEpidemiol Rec. 2011 Oct 07; 86(41):448-51. [PubMed: 21984986]
32. Centers for Disease Control and Prevention (CDC). Multistate outbreak of monkeypox--Illinois, Indiana, and Wisconsin, 2003. MMWR Morb Mortal Wkly Rep. 2003 Jun 13;52(23):537-40
33. Dr Veena Aggarwal, Consultant Womens' Health, CMD and Editor-in-Chief, IJCP Group &Medtalks Trustee, Dr KK's Heart Care Foundation of India, , 03 June 202
34. Marriott, Kathleen A.; Parkinson, Christopher V.; Morefield, Samantha I.; Davenport, Robert; Nichols, Richard; Monath, Thomas P. (January 2008). "Clonal vaccinia virus grown in cell culture fully protects monkeys from lethal monkeypox challenge". Vaccine. **26** (4): 581–588.
35. "Monkeypox". Archived from the original on 2022-04-21.Retrieved 2022-04-27.
36. Kantele A, Chickering K, Vapalahti O, Rimoin AW (August 2016). "Emerging diseases-the monkeypox epidemic in the Democratic Republic of the Congo". Clinical Microbiology and Infection. **22** (8): 658–659

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