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Review article

Monkeypox: History to Current Knowledge

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ABSTRACT

The monkeypox virus is the source of this zoonotic illness, which has symptoms similar to smallpox. When compared to smallpox, the clinical severity of monkeypox is lower. The term "monkeypox" was created after the disease was found in a location in 1958 where monkeys were housed for scientific purposes. The first human cases of monkeypox were documented in the Congo in 1970. Primarily found in Central and West Africa is the monkeypox virus. The first recorded monkeypox outbreak outside of Africa occurred in the Americas in 2003. Human contact with domestic dogs that were infected with monkeypox was linked to this outbreak. Monkeypox was not reported as an active case in India until May 31, 2022. However, India should be prepared as well, just like any other nation, since the number of active cases is rising in non-endemic countries. The virus that causes monkeypox is a double-stranded DNA virus with an envelope. This virus belongs to the genus Orthopoxvirus, which is in the family Poxviridae. The virus that causes monkeypox has been identified in two strains: the West Afican strain and the Congo basin strain. Transmission occurs through very intimate touch that has existed for a long period between humans. Mostly, nasal secretions are the means of transmission for this. Additional means of transmission include direct contact with bodily fluids or fluids released by lesions. Contact with clothing, utensils, and furniture that have fluids released from a monkeypox victim is one of the indirect ways of infection. Human-to-animal transmission of the monkeypox virus occurs when an animal bites or scratches another animal. These creatures include rats, squirrels, apes, monkeys, and their undercooked flesh.

Keywords: *Monkeypox; Smallpox; Zoonotic disease; DNA virus; Respiratory droplets; Personal Protective Equipment.*

Abbreviations:

VZV: Varicella-zoster virus; MPX: Monkeypox; PPE: Personal Protective Equipment; DNA: Deoxyribonucleic acid; PCR: Polymerase chain reaction; NPS: Nasopharyngeal swabs; OPS: Oropharyngeal swabs; VTM: Viral transport media; SSGT: Serum separating glass tube; EDTA: Ethylenediamine tetra acetic acid; ORS: Oral rehydration solution; IPC: Infection Prevention and Control.

Introduction

Although the monkeys from whom they were originally isolated gave the virus its name, rodents served as the virus's original reservoir. Humans in Africa become infected with this virus when they come into close contact with animals that are infected. It is quite uncommon to learn that the monkeypox virus spreads from person to person. Human cases of monkeypox are characterized by smallpox-like lesions and a general malaise. The signs and symptoms of varicella zoster, a virus-causing illness, are comparable to those of monkeypox. Monkeypox disease lesions are comparable in size, diffuse, and have an outward

dissemination. Enlargement of the lymph nodes is the primary symptom of monkeypox [1].

In 2003, spread of monkeypox disease was first reported in the western world, starting from America, where around 70 persons were suffering from this disease. This spread was associated with dogs that were kept in close contact with rodents of Ghana country. Persons suffering from this disease have reported enlargement of lymph nodes, rashes and fever, these symptoms were noticed after 12 days from the initial exposure. There was no casualty reported out of nine hospitalized cases. It has been noticed that vaccines given for the smallpox disease can also provide immunity against monkeypox disease. Long term observation also suggests that immunity gained due to smallpox vaccine decreases as the time passes at the community level, due to more use of imported animals in domestic purpose [2].

In contrast to smallpox, monkeypox illness symptoms are less severe. The term "monkeypox" was originally used in 1958 when the disease was found in an area where monkeys were housed for scientific purposes. The first human cases of monkeypox were documented in the Congo in 1970. Primarily found in Central and West Africa is the monkeypox virus. The first recorded monkeypox outbreak outside of Africa occurred in the Americas in 2003. Dogs that were kept in close proximity to Ghanaian rats were linked to this outbreak [3].

Epidemiology

Causative organism

The DNA virus responsible for monkeypox is double-stranded and contains an envelope. This virus is classified as belonging to the genus Orthopoxvirus and family Poxviridae. There are two strains of the virus that cause monkeypox: the Congo basin strain and the West African strain. The strain from the Congo Basin is more contagious and has a more severe character. That nation is Cameroon, where both strains are present [4].

Reservoir

Reservoir of natural origin is not known. But, some rodents and primates excluding humans, can easily get infected from monkeypox virus [5].

Period of incubation

It is of 6 to 13 days.

Infection time

It is 1-2 days earlier than appearance of rashes, till symptoms get reduced [6].

Routes of transmission

- Transmission from one human to other human takes place through a very close contact, existing from a long time. This transmission takes place mainly by nasal discharges.
- Other modes of transmission are contacts directly with fluids of body or fluids discharged from the lesions. Indirect modes of transmission are contact with clothing, utensils and furniture having fluids discharged from a person suffering from monkeypox.
- Transmission from one animal to other human takes place, through scratch, bite or improperly cooked meat of animals having the monkeypox disease [7].

Types of cases

Case of suspected origin

Any individual who has traveled to a nation where there are people afflicted with this disease and who have at least one of the following characteristics, along with rashes of unknown origin, for more than 21 days:

- Pyrexia
- Pain in head
- Pain in body
- Lymph nodes, who has got swollen
- Weakness of severe nature [8].

Case of probable origin

Any person who fulfils the criteria of case of suspected origin, matching illness and strong geographical association [9].

Case of confirmed origin

Any person who is diagnosed with monkeypox virus by laboratory examination, using PCR [10].

Methodology

A thorough analysis of the literature published between 1990 and 2023 in a variety of offline and online publications was conducted. Science Direct, PubMed, Taylor & Francis, Google Scholar, and other websites were among the many online resources. The examination, analysis, and scrutiny of over 100 published research and review papers was conducted. Only 20 papers were chosen for in-depth analysis after analysis. The results of these chosen publications constitute part of this investigation. Monkeypox, epidemiology, routes of transmission, clinical features, diagnosis, complications, management, risk communication, preventative strategies, etc. were some

of the terms utilized in the literature search. With the distinguished faculty members of the Nibha Institute of Pharmaceutical Sciences, Rajgir, a range of topics were covered. The six-month study period ran from March 2023 to August 2023. For this study, the Nibha Institute of Pharmaceutical Sciences, Rajgir, library and computer department were extensively utilized.

Results and Discussion

Case identification

Wearing and removing of personal protective equipment (PPE) should be done with special attention and standard protocol should be followed [11].

Management

Steps of Management

- Isolation of patient
- Protection of compromised skin and mucous membranes
- Rehydration therapy and Nutritional support
- Alleviation of symptoms
- Complication handling [12].

Isolation of patient

- Patient should be isolated in a separate room with proper ventilation, either in the home or in the hospital.
- Mask with three layers should be worn by the patient.
- Cavities of the skin should not come in contact with any other person. Body should be fully covered by clothes for this purpose.

Patient should be isolated till all cavities of the skin has recovered fully [13].

Complication handling

Patient will be carefully watched for the below features:

- If there is problem in eye
- Dyspnoea, problem in thorax
- Unawareness
- Oliguria
- Dysphagia
- Laziness

If any feature is present, patient will be transferred to a specialized hospital [14].

Identification of contact

Contact is any person who has got exposed to case of probable origin or case of confirmed origin:

- Exposure of face
- Physical exposure
- Exposure of materials having contamination

Contact should be identified from society, college, office, hospital, etc [15].

Handling of contact

Handling of contact should be done for minimum 21 days, for the appearance of features [16].

Methods of prevention

People should be educated about methods of prevention. They are as follows:

- Contact with fomites should be avoided.
- Cases of confirmed origin should be separated.
- Hand should be washed regularly by water and soap or by sanitizer having alcohol.
- PPE should be used by healthcare worker [17].

Conclusion

The globe has become a global village because of international travel, ships, and cargo, even though monkeypox is not a pandemic illness. As a result, the disease's chances of spreading have increased because it is a zoonotic disease. The government and authorities of every nation should take extra precautions to stop this virus from spreading in order to avoid it becoming a pandemic illness similar to corona. This study also indicates that there is a great deal of untapped research potential in the area of efficient illness management. To manage and prevent this illness, new treatment plans and vaccination programs ought to be developed. Health professionals working at the community level should raise public knowledge about monkeypox so that everyone is aware of it.

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Conflict of Interest

None declared.

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