Monkeypox Disease

Monkeypox is a contagious viral disease which can affect humans and some animals alike. Fever, headache, muscle cramps, chills, backache, and excessive exhaustion are common early symptoms. Lymph nodes swelling behind the ear, below the jaw, throughout the neck, or in the groyne are common. This is succeeded by a rash that appears in the mouth, on the cheeks, hands and feet, genitals, as well as eyes, with blisters and crusts. The average time between exposure to the beginning of symptoms is 12 days, however, it can be anywhere from 5 to 21 days. Symptoms last between 2 to 4 weeks on average. Severe cases can occur, particularly in children, pregnant women, and those with weakened immune systems.
The topic has a very high chance of being asked as a UPSC Prelims Science and Technology Question or as a Current Affairs Question, as it has been in the news recently.

About Monkeypox

Handling raw meat, an animal bite or scrape, body fluids, infected items, and/or close contact with an infected human can all spread monkeypox. Certain rodents are normally infected with the virus. The virus's DNA can be tested on a lesion to confirm the diagnosis. The condition might resemble chickenpox in appearance. The smallpox vaccine is 85 per cent effective in preventing illness. Jynneos, a monkeypox vaccination for adults, was authorised in the United States in 2019. The current treatment regimen is tecovirimat, an antiviral that is specifically designed to treat orthopoxvirus infections like smallpox and monkeypox. In the European Union and the United States, it is licenced for the treatment of monkeypox. Cidofovir or brincidofovir may be beneficial as well. If left untreated, the Congo Basin (Central African) strain of monkeypox has been reported to have a mortality rate of 10% to 11%.

History of Monkeypox Virus

Monkeypox virus was initially discovered in lab monkeys in Copenhagen, Denmark, in the year of 1958. The virus does not have a natural reservoir in monkeys. The very first human cases were reported to be discovered in the Democratic Republic of Congo in 1970. An outbreak in the United States in 2003 was linked to the sale of rodents brought from Ghana at a pet store. In 1964, a monkeypox epidemic was recorded in the Rotterdam Zoo. Monkeypox was later discovered in multiple lab monkeys in the United States. After 1968, no more cases of lab monkeys emerged as situations for monkeys changed and the demand for monkeys from Asia and Africa, which were mostly used to produce the polio vaccine, decreased. The virus was never discovered in Asia, and the fact that it was found in Asian monkeys was most likely due to infection in captivity and travel, or contamination.
In 1970, an unimmunized 9-month-old child in the Équateur Region of the Democratic Republic of the Congo became the first recorded instance in humans. Between 1970 and 1979, about 50 cases have been recorded, with Zaire accounting for nearly two-thirds of them. Liberia, Nigeria, the Ivory Coast, and Sierra Leone were among the countries with other instances of cases. Over 400 cases of humans had been recorded by 1986. In tropical Central and West Africa, small viral epidemics with a mortality rate of 10 per cent and a subsequent human-to-human rate of infection of around the same amount are common.

Monkeypox Causes

Monkeypox is caused by an infection with the monkeypox virus, a double-stranded DNA virus belonging to the genus Orthopoxvirus and the family Poxviridae. The virus is mostly found in Central as well as West African tropical rainforests. The virus is divided into clades that correspond to the geographical locations of the Congo Basin as well as West Africa. The majority of monkeypox cases in humans are caught from an infected animal, while the exact mechanism of transmission is uncertain. The virus is believed to enter the body via broken skin, the nasal passage/respiratory tract, or even through the mucous membranes of the eye, nose, and mouth. Spread to other people is common whenever a human has been infected, especially family members and healthcare staff being particularly vulnerable.

Close proximity with an infected person is regarded to be the primary mode of human-to-human transmission. There are signs that transmission takes place during sexual activity. Bite or scratch, bush meat preparations, direct contact with bodily fluids as well as lesion materials, or indirect contact with lesion material, including through compromised bedding, are all possible methods of animal-to-human transfer.

An animal may infect people through a bite or direct contact with an infected organism's bodily fluids. The virus can also transmit from human to human by respiratory (air - borne) transmission or contact with the body fluids of an infected individual. Sharing a bed or apartment with an infected individual, as well as using the same cutlery, are all risk factors for infection. Conditions involving the entry of viruses into the oral mucosa have been linked to an enhanced transmission risk. Symptoms of monkeypox usually appear 5 to 21 days after actually getting infected. The spread of the strain which caused the 2022 outbreak is still being investigated, although it is not believed to be distinct from other West African clade variants.

Monkeypox Reservoir

The virus has been identified in Gambian pouched rats (Cricetomys gambianus), dormice (Graphiurus spp.), as well as African squirrels, in addition to monkeys (Heliosciurus, and Funisciurus). The consumption of such animals as food could be a major source of disease transmission to humans. Monkeypox has yet to find a specific reservoir. Despite their name, monkeys are not a major reservoir of the virus. African rodents, like the ones described above, are thought to be the main reservoir.

Monkeypox Diagnosis

Other rash disorders, like chickenpox, measles, bacterial skin problems, scabies, syphilis, and medication-related allergies, must be considered in the clinical differential diagnosis. Monkeypox disease can be distinguished from chickenpox or smallpox by lymphadenopathy well during the prodromal phase of illness. The virus can be tested to confirm the diagnosis. The primary laboratory test is polymerase chain reaction (PCR) evaluation of specimens from skin lesions. Since the virus doesn't really stay in the blood for very long, PCR blood test results are frequently inconclusive. The date of commencement of fever, date of the beginning of rash, date of sample collection, the present state of rash, as well as patient age is all needed to evaluate test results.

Monkeypox Prevention

Vaccination for smallpox is thought to confer protection from human monkeypox infections because the viruses are so similar, and also the vaccine helps protect animals from experimentally deadly

monkeypox challenges. Since systematic smallpox vaccination was abandoned after smallpox was eradicated, this has not been shown clearly in people. Across Africa, the smallpox vaccine has been shown to minimise the risk of monkeypox in formerly vaccinated people. Monkeypox epidemiology is influenced by a decline in poxvirus immunity amongst the exposed populations. It's ascribed to declining cross protective immunity in those who were inoculated before the end of bulk smallpox immunizations in 1980, as well as an ever-increasing proportion of unvaccinated people.

The US Centre for Disease Control and Prevention (CDC) suggests that anybody investigating monkeypox outbreaks or catering for infected people or animals get a smallpox immunisation to protect themselves from the disease. Vaccination is also recommended for anyone who has had close or personal contact with monkeypox-infected individuals or animals. Prior to actually caring for an infected individual, the CDC suggests that healthcare professionals put on a complete set of personal protective equipment (PPE). A gown, mask, glasses, and a filtering disposable respirator (like an N95) are included. To prevent others from coming into contact with an infected person, they should be separated in a negative air pressure chamber or at the very least a secluded exam room.

Monkeypox Treatment

Tecovirimat is licenced for the treatment of numerous poxviruses, including monkeypox, throughout the European Union as well as the United States. If antiviral treatment is needed, BMJ Best Practice suggests tecovirimat or the smallpox medication brincidofovir, combined with supportive therapy (inclusive of antipyretic, fluid balance and oxygenation). If subsequent bacterial or varicella zoster disease is suspected, conventional antibiotic therapy or aciclovir may indeed be utilised.

The 2022 Monkeypox Epidemic

In May 2022, a number of instances and hubs of monkeypox were discovered in the United Kingdom, followed by Spain and Portugal, all of which were swiftly identified as being part of a major and still ongoing monkeypox outbreak. The first confirmed case, with travel linkages to Nigeria, was confirmed on May 6, 2022, but it's been speculated that infections had been spreading throughout Europe for months before that. Information with regards to the strain of the virus responsible for the 2022 epidemic is not available yet.