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Diagnosis and Etiologies of Monkey Pox Disease

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A B S T R A C T

Monkeypox in humans is transmitted through direct contact with infected animals or through the bite of an infected flea. This literature review aimed to describe the clinical aspects and management of monkey pox. Risk factors that can influence the spread of the monkey pox virus to humans are contact with infected animals, flea bites, travel history or being in monkeypox endemic areas, people with immunodeficiencies, age, and occupation factors. The clinical symptoms of monkeypox in humans are often similar to those of smallpox in humans. The time between infection and the onset of clinical symptoms usually ranges from 5 to 21 days, with an average of 12 days. Treatment of monkeypox is mostly supportive and aims to reduce symptoms and prevent complications. In order to prevent the spread of monkeypox, it is very important to avoid contact with animals infected with the monkeypox virus and to take other precautions, such as ensuring good hygiene and avoiding tick bites.

1. Introduction

Monkeypox is a disease caused by the same virus as the human smallpox virus.[1] The prevalence of monkeypox in humans is relatively low and rare. This disease has become a global awareness since May 13th, 2022. WHO received reports of cases of monkeypox from non-endemic countries. The disease is more common in West and Central Africa, where wild animals infected with the monkeypox virus live. In August 2022, one positive monkeypox case was found in Indonesia in a 27-year-old male patient.[2]

Outbreaks of monkeypox can cause serious and significant health consequences in affected communities. Monkeypox in humans is transmitted through direct contact with infected animals or through the bite of an infected flea. Symptoms are similar to those of smallpox in humans, including a mottled skin rash, fever, headache, and muscle aches. However, in rare cases, monkeypox can cause serious complications and even death in individuals with weakened immune systems.3-5 This literature review aimed to describe the clinical aspects and management of monkeypox.

Etiology and risk factors for monkeypox

Monkeypox disease is caused by the monkeypox virus, which is included in the family *Orthopoxvirus*, the same as the viruses that cause smallpox (varicella), vaccinia, and cowpox. The monkeypox virus was first identified in 1958 when cases of a disease resembling smallpox appeared in primates imported to a research laboratory in Denmark.[4] The virus was later found to spread from animals to humans and can occasionally spread from human to human. The

monkeypox virus is a zoonotic disease, meaning this virus is transmitted from animals to humans. Owners of exotic pets, animal breeders, or people who have frequent contact with infected wild animals have the highest risk of being infected with the monkeypox virus. In the case of the 2022 monkeypox outbreak in non-endemic countries, most of the patients had a gay sexual orientation or same-sex relationship.[6,7]

There are several risk factors that can increase a person's chances of being infected with monkeypox. Risk factors that can affect the spread of the monkeypox virus to humans are contact with infected animals, flea bites, history of travel or being in a monkeypox endemic area, same-sex relationship (gay or lesbian), people with immunodeficiencies, age, and occupation. People who have direct contact with animals infected with the monkeypox virus, such as zoo workers, veterinarians, or breeders, have a higher risk of infection. Flea bites infected with the monkeypox virus can transmit this disease to humans.[7-10]

Studies on monkeypox outbreak cases in 2022 state that 95% of monkeypox infections are spread due to sexual contact.[6] About 95% of people in the study had a rash, mostly on the genitals. About 41% had internal injuries (including the anus or mouth). The study also revealed that the monkeypox virus was found in more than 90% of the semen samples tested.

People who have a weakened immune system, such as people with HIV/AIDS or those undergoing cancer treatment, have a higher risk of being infected with monkeypox. Older children and adults tend to have a higher risk of being infected with monkeypox. In order to prevent the spread of monkeypox, it is very important to avoid contact with animals infected with the monkeypox virus and to take other precautions, such as ensuring good hygiene and avoiding tick bites.[8]

Monkeypox clinical symptoms

The clinical symptoms of monkeypox in humans are often similar to those of smallpox in humans. The time between infection and the onset of clinical symptoms usually ranges from 5 to 21 days, with an average of 12 days. Early symptoms of monkeypox are often flu-like, including fever, headache, and fatigue. A few days later, the skin may become itchy and develop a mottled skin rash on the body, face, and palms. This skin rash then develops into fluid-filled blisters, which can dry out and form a crust. Apart from that, patients with monkeypox can also experience other symptoms, such as muscle pain, swollen lymph nodes, and abdominal pain.[9]

Although monkeypox rarely causes death in humans, rare cases can lead to serious complications, such as secondary bacterial infections, pneumonia, and encephalitis (inflammation of the brain). In people who have a weak immune system, the risk of these serious complications can be higher.[10,11]

Diagnosis of monkeypox

The diagnosis of monkeypox is based on anamnesis, clinical symptoms, travel history, and laboratory tests. A physical examination in the form of skin rashes, swollen lymph nodes, and sampling of skin bubbles is necessary to diagnose monkeypox. Travel history anamnesis was carried out to find out whether they had traveled to areas where monkeypox was endemic or had a history of contact with animals infected with the monkeypox virus. Laboratory tests are used to identify the monkeypox virus in samples of blood, saliva, or other body fluids. Serological tests can also be used to detect antibodies to the monkeypox virus in the blood.[12,13]

Differential diagnosis of smallpox monkeys

There are several other medical conditions that can cause symptoms similar to monkeypox and can be used as a differential diagnosis. Several medical conditions that can be considered as a differential diagnosis of monkeypox include chickenpox, contact dermatitis, urticaria, and other bacterial and viral infections. [14]

Chickenpox is a disease caused by a virus similar to the monkeypox virus. Varicella causes an extremely itchy skin rash and blisters all over the body. The initial symptoms of chickenpox are similar to those of the flu, followed by a mottled skin rash that spreads all over the body. This infection is highly contagious and often affects children. Some of the other symptoms associated with chickenpox include fever, headaches, and tiredness. Chickenpox generally clears up on its own within 1-2 weeks without requiring special treatment, although certain

medications can help reduce symptoms. The difference between varicella and monkeypox is that monkeypox is transmitted from animals to humans, mainly through animal bites or direct contact with the body fluids of infected animals. Monkeypox symptoms are similar to chickenpox but usually more severe and include swollen lymph nodes. Although monkeypox is less common than chickenpox, it has a higher severity and requires more intensive medical treatment.[15]

Several other viruses, such as the Epstein-Barr virus and Coxsackie virus, can cause symptoms similar to monkeypox. Epstein-Barr virus is known as infectious mononucleosis and commonly affects adolescents and young adults, although children can also be affected. The spread of the Epstein-Barr virus is primarily through saliva, such as when sharing food, drink, or toothbrushes with an infected person. This infection can also be spread through blood and other body fluids, such as tears and urine. Symptoms of infectious mononucleosis include fever, sore throat, swollen lymph nodes, tiredness, and skin rash. Some people may also experience headaches, muscle aches, and stomach pain. Symptoms generally begin to appear around 4-6 weeks after exposure to the virus, although in some cases, symptoms can appear within 2-3 weeks.

Contact dermatitis is a type of allergic skin reaction caused by contact with certain substances, such as soaps or poisonous plants. The main symptom of contact dermatitis is an itchy skin rash that appears over the affected area. Contact dermatitis is an inflammatory reaction of the skin caused by contact with an irritating or allergic substance. Symptoms include itching, redness, swelling, and skin rashes. This reaction can occur immediately after contact with the substance that caused it or several days after contact. Contact dermatitis treatment involves avoiding the substance that caused it and taking topical or oral medications to relieve symptoms.

Urticaria or hives is a medical condition that causes an itchy, red skin rash that usually lasts a few hours to a few days. This rash can appear suddenly and is usually as small blisters that separate or coalesce into larger plaques. Urticaria can be caused by a variety of factors, including allergies, infections, or physical pressure on the skin.

Bacterial infections, such as impetigo and cellulitis, can also cause skin rashes and swollen lymph nodes. A bacterial skin infection is a condition that occurs when bacteria enter the skin through a cut or scrape or when bacteria grow on broken skin. This infection can cause redness, swelling, pain, and pus in the infected area. Some common types of bacterial skin infections include cellulitis, impetigo, and furuncles. The main difference between a bacterial skin infection and a monkeypox is the cause. Bacterial skin infections are caused by bacteria, while monkeypox is caused by viruses. In addition, bacterial skin infections can occur anywhere on the body, while monkey pox usually appears in certain areas of the body. Bacterial skin infections can also be treated with antibiotics, while monkey pox requires more intensive medical treatment.

Monkeypox therapy

Treatment of monkeypox is mostly supportive and aims to reduce symptoms and prevent complications.[16] There is no specific treatment for monkeypox. Treatment that can be given to patients with monkeypox is skincare, antiviral therapy, and immunoglobulin therapy. Patients with monkeypox should avoid excessive scratching of the skin, avoid skin damage or wounds, and maintain good hygiene to prevent secondary infection. Patients should also get enough rest, drink lots of water, and eat a healthy diet to speed recovery. Patients can be given skin treatments consisting of cold showers or the use of cold compresses to help relieve itching and inflammation. Creams and lotions that contain antihistamines or corticosteroids can also help relieve itching and reduce skin inflammation.

Although there are no specific antiviral drugs available to treat monkeypox, antiviral therapy can help speed recovery and reduce symptoms in some cases. Antivirals such as acyclovir or ribavirin may be used in some cases depending on the type of virus causing the infection. Acyclovir is an antiviral drug used to treat infections with the herpes simplex virus (HSV) and varicella-zoster virus (VZV). This drug works by blocking the ability of the virus to replicate and spread in the body. Ribavirin is an antiviral drug used to treat viral infections, especially hepatitis C virus (HCV) and syncytial virus respiratory (RSV). This

drug works by inhibiting viral replication and stopping the growth of virus-infected cells. Ribavirin is usually used in combination with other antiviral drugs to treat HCV virus infection. This combination of antiviral drugs can help increase the body's ability to eliminate viruses from the body. Ribavirin is also used to treat RSV infection in children and adults with weakened immune systems. Using ribavirin can cause side effects, including anemia, headache, nausea, vomiting, and fatigue. Some more serious side effects may occur, including bone marrow depression, high blood pressure, and breathing problems.

Immunoglobulin therapy or plasma transfusions from patients who have recovered from monkeypox can also be used in patients who are at high risk of complications. Plasma transfusion therapy for monkeypox is still controversial and not widely used in the treatment of this disease. Plasma transfusion therapy in monkeypox refers to the procedure of taking plasma from people who have recovered from monkeypox infection and then transfusing it into patients who are currently infected. Plasma taken from people who have recovered is thought to contain antibodies that can help patients fight viral infections. Although plasma transfusion therapy has been used to treat other viral diseases, such as SARS and influenza, the effectiveness and safety of the therapy in monkeypox are still not fully understood. Several small studies have been conducted in humans and animals, but the results have not been able to lead to clear conclusions.[14,15] Nevertheless, plasma transfusion for monkeypox is still a treatment option that can be considered in an emergency situation if no other treatment options are available. However, the decision to use plasma transfusion therapy must be made carefully and with due consideration of the potential benefits and risks to the patient.

2. Conclusion

Monkeypox disease is caused by the monkeypox virus, which is included in the family *Orthopoxvirus* and transmitted from animals to humans. Treatment of monkeypox is mostly supportive and aims to reduce symptoms and prevent complications. In order to prevent the spread of monkeypox, it is very important to avoid contact with animals infected with the monkeypox virus and to take other precautions, such as ensuring good hygiene and avoiding tick bites.

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