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Zoonotic disease caused by Monkeys

Jitendra Kumar Bagra[1], Shoeb khan[1], Pinky Preety[2], Anamika Panday[1]
[1]MVSc scholar, ICAR-Indian Veterinary Research Institute, Izatnagar, Bareilly-243 122, Uttar Pradesh, India
[2]MVSc scholar, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana-141012, Punjab, India

Abstract

Since humans and nonhuman primates share a close genetic relationship, disease-causing organisms can easily spread between them. Every researcher and member of the husbandry staff who works with macaques and marmosets, monkey body fluids, cell cultures derived from macaques & marmosets, or equipment that has come into contact with infected macaque body fluids, faeces, or urine must be aware of the safety measures needed to prevent the spread of the Herpes B virus.

Keywords: Macaques, Marmosets, Zoonotic

Introduction

The close genetic relationship between humans and nonhuman primates, disease causing organisms are easily exchanged between them. Bacteria, fungi, parasites, and viruses are the pathogens that can be transferred from nonhuman primates to humans and vice versa. They can spread through bites, scratches, handling of animals or their tissues, ingestion, arthropod vectors, and aerosol and droplet transmission mechanisms. Often the nonhuman primate carries and transmits disease with nonvisible signs. Persons in touch with these animals should remember of the potential risks involved.

This is often very true when animals are under stress, like people who are recently shipped or introduced into a replacement situation or have developed a recent illness. like many communicable diseases, immunocompromised persons are at greatest risk for infection or serious consequences from such infections.

Zoonoses associated with old world monkeys (Macaques)

All researchers and husbandry staff who handle macaques, macaque body fluids and cell cultures derived from infected macaques or equipment that has are available contact with infected macaque body fluids, faeces, and urine must be conversant in precautions required to stop transmission of Herpes B virus (Cercopithecine Herpesvirus 1).

Humans can spread diseases, like measles (rubeola) or tuberculosis to macaques.

Zoonotic agents of concern:

Herpes B

All macaques are thought to be able to shed the herpes B virus, even though they don't need to show any signs of the illness.

- After coming into contact with infectious monkey tissues or fluids, humans contracted the disease. the secretion from a monkey's eyes, mouth, or genitalia, as well as the possibility of infection from the spinal fluid and CNS tissues of monkeys. Macaque kidney-derived voltaic cell cultures could be a source of viruses.
- Through macaque bites and scratches, splashes of liquid body substances like saliva, conjunctival secretions, or genitourinary secretions into the eyes, nose, and mouth, broken skin contact with macaque body fluids, or soiled equipment that has been in contact with macaques, the virus is transferred from macaques to humans.
- Exposures may result within the transmission of the Herpes B virus which features a 70% deathrate in humans if not treated immediately. Onset of disease can occur within 3 to 6 days and up to a month after exposure. Early symptoms are flu-like and include fever, headache, and skin lesions at the location of exposure. Respiratory involvement and death can occur 1 day to three weeks after symptom onset.

You can get infected with Herpes B virus if you:

- ✓ are bitten or scratched by an infected monkey.
- ✓ get an infected monkey's tissue or fluid on your broken skin or in your eyes, nose, or mouth.
- ✓ have a needle stand by a contaminated syringe.
- ✓ scratch or cut yourself on a contaminated cage or other sharp-edged surface.
- ✓ are exposed to the brain (especially), medulla spinalis, or skull of an infected monkey.

Only one case has been documented of an infected person spreading B virus to a different person.

Signs and Symptoms

Symptoms start within one month of being exposed to B virus but could appear in as little as three to six days.

The first indications of B viral infection are typically flu-like symptoms:

- ✓ fever and chills
- ✓ muscle ache
- ✓ fatigue
- ✓ headache

Then, you'll develop small blisters within the wound or area on your body that had contact with the monkey.

Other symptoms may include:

- ✓ Shortness of breath
- ✓ Nausea and vomiting
- ✓ Abdominal pain
- ✓ Hiccups

As the disease progresses, the virus spreads to and causes inflammation (swelling) of the brain and medulla spinalis. this will cause:

- ✓ Neurologic and inflammatory symptoms (pain, numbness, itching) near the wound site.
- ✓ Problems with muscle coordination
- ✓ Brain damage and severe damage to the systema nervosum
- ✓ Death

Problems with breathing and death can occur at some point to 3 weeks after symptoms appear. it's going to be possible for people to possess mild B viral infection or no symptoms. However, there are not any studies or evidence of this.

Rabies

With one exception, non-human primate rabies has only ever been documented in animals that were recently imported from endemic rabies regions. The exception happened in 1911 in Florida during a dog rabies epidemic after a dog bit a pet monkey. In the endemic raccoon rabies region of Florida's Ocala Springs, free-ranging macaque monkeys have not been found to have the disease.

In Florida, nearly 640 nonhuman primates were tested for rabies between 1957 (the year the raccoon rabies outbreak began in Florida) and 1974.

Simian Immunodeficiency Virus (SIV)

SIV causes an AIDS-like illness in macaque monkeys, where it is closely linked to HIV-1 and HIV-2 (the causes of AIDS) but is asymptomatic in other species. There are no reports of human illness, but there are research workers who developed antibodies to SIV after handling laboratory specimens.

Enteric Diseases

These are spread via the faecal oral route and cause similar symptoms in humans and nonhuman primates. The more common agents include -

Bacteria (Shigella, Salmonella, Campylobacter),

protozoan parasites (Cryptosporidium, Giardia, Amoeba, Balantidia),

helminth parasites (Strongyloides).

Marburg and Ebola (Filoviruses): -

When exposed to African Green Monkey tissues, men have contracted the Marburg infection. It has not been possible to isolate the Ebola viruses from the Sudan and Zaire from monkeys. When a researcher contracted the disease in 1995, the unique Ebola virus was found in West African chimpanzees. No humans became ill from the Ebola virus that broke out in a Reston, Virginia monkey quarantine facility, but four animal handlers developed antibodies to the disease. These incidents serve as a reminder that wild-caught monkeys have the potential to spread previously unidentified human pathogens.

Other macaque zoonotic agents of concern:

Virus	Bacteria	Parasites
Hepatitis A Pox viruses Respiratory syncytial virus Rotavirus Simian haemorrhagic fever virus Simian retrovirus D Simian T-cell leukaemia Simian virus 40	*Campylobacter jejuns* *Shigella* spp. *Streptococcus pnuemoniae* *Mycobacterium tuberculosis* *Bordetella brochioseptica* *Haemophilus influenzas*	*Strongyloides* spp. *Trichostrongylus* spp. *Balantidium coli*

Zoonoses associated with New World Monkeys (Marmosets)

Researchers and animal care staff should remember of the potential for transmission of zoonotic diseases when handling marmosets. Animal bites, broken skin contact with animal wastes and scratches, soiled equipment and accidental ingestion of organisms may result within the transmission of zoonotic diseases.

Humans can spread diseases, like measles (rubeola), tuberculosis and influenza, to marmosets.

Zoonotic disease	Details
Tuberculosis	*Mycobacterium* spp. could also be transmitted from humans to marmosets. The bacteria are often spread through aerosolization of the organism, which may be found within the saliva. All persons who enter marmoset areas must participate within the Occupational Health Program for Animal Workers, which incorporates annual TB testing.
Measles	Rubeola (measles) are often spread easily from humans to marmosets. A measles outbreak can devastate a marmoset colony. The virus spreads via the airborne route. All persons who enter areas where marmosets could also be housed, tested, or treated must have proof of rubeola immunity, which is included within the Occupational Health Program for Animal Workers.
Enteric Pathogens	Several pathogens could also be transmitted from marmosets to humans via the faecal oral route. Prevention of transmission is achieved through use of private protective equipment, disinfection of surfaces and equipment and proper hand hygiene.
Shigellosis	Non-human primates, including marmosets, can shed Shigella bacteria. Symptoms include diarrhoea, fever, and stomach cramps starting each day or two after ingestion of the bacteria. The diarrhoea is usually bloody. Shigellosis usually resolves in 5 to 7 days.
Salmonellosis	Salmonella bacteria, shed within the faeces of infected non-human primates, can cause fever, cramps, and diarrhoea approximately 12 to 72 hours after ingestion. Persons with impaired immune systems can develop more serious illness if treatment isn't received and therefore the infection spreads to the bloodstream.
Cryptosporidium	Cryptosporidium may be a parasite that affects many mammals. Infected animals shed the organism in their faeces. it's fairly immune to disinfectants and can still be shed in animals after symptoms of illness

	have stopped. Most humans will develop diarrhoea which usually resolves within 1 to 2 weeks without treatment. Immune compromised persons are in danger of developing serious disease.
Giardiasis	Giardiasis is caused by ingestion of the Giardia parasite. Symptoms, including diarrhoea, nausea and abdominal cramps may begin 1 to three weeks after ingestion and linger for two to six weeks. Treatment is out there and should be recommended by your healthcare provider.

Other Zoonotic Agents

Viruses like those that cause monkey pox and haemorrhagic fever can also spread through non-human primates. It's unusual for these and other viruses to be present in purpose-bred animals, however, marmosets and their body fluids should be handled as if they might be a source of infection. Wear personal protective equipment, when working with marmosets or their body fluids, practice good hand hygiene and disinfect potentially contaminated surfaces regularly.

Prevention

- Wear personal protective equipment.
- Gloves, surgical mask, lab coat, face shield or safety glasses, gown, booties, and bonnet are required when working in marmoset housing and procedures areas or when handling soiled equipment from these areas.
- Handwashing is that the most vital measure you'll fancy prevent transmission of zoonotic organisms. Wash your hands with soap and warm water after removing gloves and upon exiting the animal facility or procedure rooms.
- Persons with cold or flu symptoms or active herpes simplex lesions (cold sores) shouldn't enter marmoset housing or procedure rooms.

Treatment

If your healthcare provider determines that you simply need treatment for bacterial & virus exposure or infection, you'll be treated with antibacterial & antiviral medications. Timely care and treatment for high-risk exposures is assumed to be crucial to preventing life-threatening disease.

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