THE SCIENCE WORLD
A Monthly e Magazine
ISSN:2583-2212
April 2024 Vol.4(4), 1440-1443

Popular Article

An overview of Rabies disease

Dr. Ashok Patel, Dr. Rutvij Patel, Dr. Hirali Koladiya and Dr. Hardik Patel
College of Veterinary Science and Animal Husbandry, Kamdhenu University- 382010
https://doi.org/10.5281/zenodo.10990327

Abstract

The rabies is a zoonotic disease that caused by the virus known as lyssavirus belonging to the family Rhabdoviridae. The common ways of transmission of Rabies in humans by the bite of a rabid animal and due to saliva and consumption of meat and milk of rabid animals. Some wild animals, e.g., skunks, dogs, raccoons, foxes, and bats, can also transfer rabies in humans, mammals, and other animals. The incubation period of this disease is approximately up to six months long or in some cases, it is short up to just four days. The clinical signs and symptoms of this disease could be confused with some other diseases such as polio, tetanus, and botulism. Hence, confirmatory diagnosis is done by using techniques including polymerase chain reaction (PCR), direct fluorescent antibody test (FAT) and mouse inoculation technique. Lyssavirus is simply inactivated by the sunshine, soap, in addition to aeration. The wound concern is essential for the hindrance of rabies infectivity. Among the investigational animals, rabies spread could nearly wholly have prohibited via general wound treatment provided during the first 3 hours following disclosure of virus. As a result, it is clear that rabies is a big threat to the whole world so management strategies are required to target and overcome this threat.

Introduction

The rabies is a well-known viral infection of warm-blooded animal and humans which is affect the central nervous system (Moges, 2015; Richard et al., 2015). In the 1880s, Louis Pasteur said the Rabies virus was the etiological agent of the disease (Tarantola, 2017). The infection is characterized via the appearance of rigorous nervous symptoms that results in paralysis following the death of the patient (Abera et al., 2015). The canines especially dogs remain the primary reservoir, while, wildlife species act as hosts (Rupprecht et al., 2007). Approximately 20,000 fatalities are due to Rabies yearly in India. Rabies in humans is invariably fatal disease, even with the implementation of modern therapeutic interventions.

Transmission

Rabies virus is transmitted through direct contact (such as through broken skin or mucous membranes in the eyes, nose, or mouth) with saliva or brain/nervous system tissue from an infected animal. People usually get rabies from the bite of a rabid animal.

Path

1. An animal is bitten by a rabid animal.
2. Rabies virus from the infected saliva enters the wound.
3. Rabies virus travels through the nerves to the spinal cord and brain. This process can last approximately 3 to 12 weeks. The animal has no signs of illness during this time.
4. When it reaches the brain, the virus multiplies rapidly and passes to the salivary glands. The animal begins to show signs of the disease.
5. The infected animal usually dies within 7 days of becoming sick.

Clinical signs

The incubation period for rabies is typically 2–3 months but may vary from 1 week to 1 year, depending on factors such as the location of virus entry and viral load. Initial symptoms of rabies include generic signs like fever, pain and unusual or unexplained tingling, pricking, or burning sensations at the wound site. As the virus moves to the central nervous system, progressive and fatal inflammation of the brain and spinal cord develops. Clinical rabies in people can be managed but very rarely cured and not without severe neurological deficits.

There are two forms of rabies:

Furious rabies results in hyperactivity, excitable behaviour, hallucinations, lack of coordination, hydrophobia (fear of water) and aerophobia (fear of drafts or of fresh air). Death occurs after a few days due to cardio-respiratory arrest.

Paralytic rabies accounts for about 20% of the total number of human cases. This form of rabies runs a less dramatic and usually longer course than the furious form. Muscles gradually become paralysed, starting from the wound site. A coma slowly develops and eventually death occurs. The paralytic form of rabies is often misdiagnosed, contributing to the under-reporting of the disease.

Diagnosis

Pre-clinical and Clinical

When clinical symptoms begin to present, it becomes possible to diagnose rabies with various diagnostic techniques. The incubation period after exposure to rabies virus can vary from as little as one week to more than a year; however, most people experience symptoms after a few months. When

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 17.04.2024

symptoms present, they may include:

- Tingling/Itchiness at the infection site
- Fever
- Hyperactivity and excited behavior
- Aggressiveness
- Hydrophobia
- Photophobia
- Aerophobia

However, diagnosis based on clinical presentation alone is difficult; therefore, several tests are needed to confirm the clinical diagnosis of rabies in humans. As a result of the severity of diagnosis with rabies, it is essential that diagnostic tests provide fast results that are reliable, sensitive, and specific.

Direct fluorescent antibody test

The test involves taking a biopsy of affected tissues, such as those in the brain, which are sent to a laboratory to be analyzed for the presence of rabies. The DFA test is able to produce fast results within a few hours. Additionally, this test is sensitive and specific to the rabies virus. For 95-99% of cases, the DFA test provides an accurate indication of the presence of the disease.

Other diagnostic techniques

Direct rapid immunochemistry (IHC), polymerase chain reaction (PCR), enzyme-linked immunoassay (ELISA), Nested-PCR and mouse inoculation technique are also accepted to have adequate sensitivity and specificity. These are suitable alternatives to DFA testing, particularly to improve surveillance of rabies in endemic areas.

Treatment

Once a rabies infection is established, there's no effective treatment. Though a small number of people have survived rabies, the disease usually causes death. For that reason, if you think you've been exposed to rabies, you must get a series of shots to prevent the infection from taking hold.

Treatment for people bitten by animals with rabies

If you've been bitten by an animal that is known to have rabies, you'll receive a series of shots to prevent the rabies virus from infecting you. If the animal that bit you can't be found, it may be safest to assume that the animal has rabies. But this will depend on several factors, such as the type of animal and the situation in which the bite occurred.

Rabies shots include:

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 17.04.2024

A fast-acting shot (rabies immune globulin) to prevent the virus from infecting you. This is given if you haven't had the rabies vaccine. This injection is given near the area where the animal bit you, as soon as possible after the bite.

A series of rabies vaccinations to help your body learn to identify and fight the rabies virus. Rabies vaccinations are given as injections in your arm. If you haven't previously had the rabies vaccines, you'll receive four injections over 14 days. If you have had the rabies vaccine, you'll have two injections over the first three days.

Determining whether the animal that bit you has rabies

In some cases, it's possible to determine whether the animal that bit you has rabies before beginning the series of rabies shots. That way, if it's determined the animal is healthy, you won't need the shots.

Prevention

To reduce your risk of coming in contact with rabid animals:

- **Vaccinate your pets.** Cats, dogs and ferrets can be vaccinated against rabies. Ask your veterinarian how often your pets should be vaccinated.
- **Keep your pets confined.** Keep your pets inside and supervise them when outside. This will help keep your pets from coming in contact with wild animals.
- **Protect small pets from predators.** Keep rabbits and other small pets, such as guinea pigs, inside or in protected cages so that they are safe from wild animals. These small pets can't be vaccinated against rabies.
- **Report stray animals to local authorities.** Call your local animal control officials or other local law enforcement to report stray dogs and cats.
- **Don't approach wild animals.** Wild animals with rabies may seem unafraid of people. It's not normal for a wild animal to be friendly with people, so stay away from any animal that seems unafraid.
- **Keep bats out of your home.** Seal any cracks and gaps where bats can enter your home. If you know you have bats in your home, work with a local expert to find ways to keep bats out.
- **Consider the rabies vaccine if you're traveling or often around animals that may have rabies.** If you're traveling to a country where rabies is common and you'll be there for an extended period of time, ask your doctor whether you should receive the rabies vaccine. This includes traveling to remote areas where medical care is difficult to find.

If you work as a veterinarian or work in a lab with the rabies virus, get the rabies vaccine.

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 17.04.2024