

Rabies

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What is rabies?

Rabies is a severe viral infection of the brain transmitted to people from infected animals. Rabies encephalitis is almost always fatal, with death occurring seven to ten days from the start of the symptoms.

Causes

Rabies is caused by the rabies virus through a bite or scratch from an infected mammal. The most common species to transmit rabies worldwide are dogs (Africa and Asia) and bats (worldwide), but any infected mammal can potentially transmit rabies. Bats remain an endemic reservoir of rabies-like lyssaviruses in the UK. There is no evidence that rabies is transmitted through the consumption of milk or cooked meat of an infected animal, and rabies cannot be transmitted person-to-person, although very rarely it has been transmitted accidentally by organ transplantation from someone who died from rabies.

Although rabies has been successfully controlled in many parts of the world, about 59,000 people die of rabies world-wide every year, mostly in Asia and Africa. Children, who are more likely to be bitten, are at greatest risk.

Symptoms and diagnosis

Symptoms can appear from 20 to 90 days or even longer (up to several years) after the bite/scratch from a rabid animal. Early symptoms are often non-specific, mimicking viral infections (e.g., fever, general feeling of unwell, headache). There may be initial pain or intense itching at the site of the bite, or weakness of the affected limb. Other symptoms include intolerance to noise or light, anger and depression.

Two thirds of people infected with the virus then progress to encephalitic rabies (furious rabies), which is characterised by episodes of hyperactivity, hallucinations, agitation, confusion, muscle spasms, altered functioning of the heart, bladder, intestines, sweat glands, pupils, and blood vessels, and hydrophobia (fear of water) with hypersalivation (excessive production of saliva). The remainder develop paralytic rabies with paralysis of the limbs and respiratory muscles. It is not known why some patients develop the encephalitic form and others paralytic rabies.

Rabies is diagnosed by detection of rabies virus (e.g., in samples of saliva, cerebrospinal fluid, brain tissue or peripheral nerves in the skin), or by the detection of rabies antibody in a non-immunised (unvaccinated) patient. Tests are unable to diagnose rabies before the appearance of symptoms.

Treatment

There is no treatment to cure rabies. In exceptional cases, individuals with rabies have survived with supportive treatment. An experimental regimen known as the Milwaukee protocol (after the hospital which first employed it) was initially reported to cure a patient with bat rabies, but has since failed in a series of cases. Hospital care for rabies encephalitis is supportive, consisting of sedation (for agitation), nutritional support, supplementary fluids and analgesia (for pain).

Prevention

Rabies is a vaccine-preventable disease. Rabies vaccine can be given by two routes: intramuscularly (into a muscle) and intradermally (into the skin). The use of the intradermal immunisation regime requires a smaller quantity of vaccine but has equivalent effectiveness.

Vaccines are used to prevent the disease both before and after exposure (bite, scratch). Given the lethality of clinical rabies, post-exposure prophylaxis (to prevent the disease) is imperative.

a) Pre-exposure prophylaxis

Pre-exposure prophylaxis is recommended for persons who are at high risk of exposure to rabies because of their occupation (e.g. veterinarians, animal handlers, rabies researchers etc), travel or residence in rabies-endemic areas. It comprises active immunisation with multiple doses of rabies vaccine, over one to four weeks.

Vaccine immunity wanes, so booster vaccination may be needed in people at continuous risk. In the event of exposure to rabies, post-exposure prophylaxis (PEP) with vaccination is still required for those who have received pre-exposure vaccination, but without the need for immunoglobulin.

b) Post-exposure

Rabies can be effectively prevented after a bite through post-exposure prophylaxis (PEP) which comprises:

- wound cleansing,
- active immunisation with multiple doses of rabies vaccine, over one to four weeks and
- passive immunisation with human rabies immunoglobulin injected into the wound and intramuscularly.

Rabies among travellers

Travellers need to be aware of the risk of rabies and take preventive measures which include:

- Knowing if the country they visit is endemic for rabies.
- Vaccination (pre-exposure prophylaxis) before travelling in areas with a high risk (it takes one week to complete the vaccine course).
- Avoiding contact with animals; even a bite from what appears to be a harmless pet must be considered carefully.
- Getting information about PEP measures in the area they travel to: where the closest medical facilities with PEP are and what to do in case of a contact with an infected animal.

First aid in case of a bite (World Health Organisation):

- wash and flush the wound with soap and water for 10-15 minutes,
- clean the wound with 70% alcohol/ ethanol or povidone-iodine or a similar antiseptic if available, and
- seek medical attention immediately.

Rabies prevention and control

Globally, dogs are the overwhelming source of human rabies. Mass vaccination of dogs is the most cost-effective way to eliminate rabies. Rabies elimination remains a significant public health challenge, due to the lack of resources for vaccination programmes and rabies surveillance in endemic regions.

Other resources

- Global Alliance for Rabies Control (GARC)

<http://rabiesalliance.org>

- World Health Organisation (WHO)

<http://www.who.int/rabies/about/en/>

- NHS (Rabies vaccination within UK) <http://www.nhs.uk/Conditions/Rabies/Pages/Prevention.aspx>

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