Rabies

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What is rabies?

Rabies is a severe viral infection of the brain and spinal cord that is transmitted by infected animals. Human rabies is a disease with almost 100% fatal outcome (death) usually after seven to ten days from the start of the symptoms.

Causes

Rabies is caused by the rabies virus through a bite from infected animals such as dogs in rabies endemic areas (Africa and Asia) or bats (North America). There are also reports of human rabies due to bites of cats, mongooses, jackals, foxes, wolves and other carnivorous animals. There is no evidence that rabies is transmitted through the consumption of milk or cooked meat of an infected animal.

Although rabies has been successfully controlled in many parts of the world, there are estimated 25,000 deaths every year in Africa with about one death every 20 minutes. Children are at a high risk as they tend to get in contact with infected animals more frequently.

The virus can’t get through if the skin is intact, but can pass through pre-existent scratches or through intact mucosa (mouth, nose, and eye). Rabies can’t be transmitted from human to human; the human is the host end. However, it can be transmitted through transplantation of tissues or organs from someone who died from rabies.

Symptoms and diagnosis

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

Eighty percent 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). 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.

Diagnosis is made based on symptoms and history of exposure. There are no tests to diagnose rabies before the symptoms appear.

**Treatment**

Although, there is one survival case, presently, there is no successful treatment if the patient has developed symptoms of the illness. Care in hospital for a patient with rabies encephalitis consist of sedation, keeping the patient free from physical pain and emotional support in a quiet room. Intravenous fluids are recommended for the patients with hydrophobia because they become progressively thirsty.

**Prevention**

Rabies is a 100% preventable disease: there is a pre-exposure prevention and a post-exposure prevention.

a) Pre-exposure

World Health Organisation (WHO) recognises two ways of vaccination: one administered intramuscularly (into a muscle) and the other one intradermally (into the skin). The use of the intradermal immunisation regime is recommended as it requires a smaller quantity of the vaccine than the intramuscular one and gives a better antibody response.

The vaccine provides immunity only for a limited period of time, boosters being needed depending on the level of risk. In the event of exposure to rabies, post-exposure prophylaxis (PEP) is still required for those who have received pre-exposure vaccination.
b) Post-exposure
Rabies can be effectively prevented after a bite through post-exposure prophylaxis (PEP) which includes:
- wound cleansing,
- active immunisation with multiple doses of rabies vaccine, and
- passive immunisation with human rabies immuno-globulin injected into and around the wound and intramuscularly.

The aim of the PEP is to prevent the virus going into the brain and spinal cord. It is effective only before the signs of the illness develop.

Dogs are the main source of transmission of rabies to humans. Mass vaccination of dogs is recognised as the most cost-effective and sustainable way to eliminate rabies in humans.

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.
- vaccination before travelling in areas with a high risk (it takes three to four weeks 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 are the closest medical facilities with PEP and what to do in case of a contact with an infected animal.

First Aid in case of a bite recommended by 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
- contact a health care facility immediately.

Challenges faced by the rabies’ prevention and control
Rabies mainly affects poor and marginalised populations. Rabies is a 100% preventable disease. However people are dying of rabies because of lack of education or financial means:
• people do not know about rabies, what to do in case of exposure or about PEP.
• pre-exposure vaccination or PEP is not available in their area.
• they have no financial means to access pre-exposure vaccination or PEP.
• dog vaccination is difficult to implement in some areas.
• health care professionals haven’t got adequate training.

There is also a lack of effective preventable human and veterinary programmes and strategies and effective surveillance programmes. Even if rabies is a notifiable disease, the reported data is not accurate. Recent studies have shown an increase incidence of human rabies infection in children in some parts of the world such as Malawi (Africa).

In other parts of the world (Latin America) One Health approach (a collaborative way to address animal and public health globally) succeeded in reducing the prevalence of canine rabies and human fatalities (deaths) nearly vanished. This approach recognised the importance of mass dog vaccination and effective surveillance across human health and veterinary sectors.

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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If you would like more information on the source material the author used to write this document please contact the Encephalitis Society. None of the authors of the above document has declared any conflict of interest which may arise from being named as an author of this document.

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