

RABIES: STILL PREVALENT IN BANGLADESH

In most developed countries, the spread of rabies virus is very limited. But in Bangladesh, up to this time, a good number of people are being infected by rabies and many are suffering from consequences. In Bangladesh and most other parts of Asia, domestic dogs are the main vectors. Though any infected mammals eg, bats, dogs, foxes, raccoons may transmit the virus to man; Even infected man can transmit the virus if he/she bites anybody when the virus is present in large amount in the saliva. In other parts of Asia, other wild animal vectors include monkeys, jackals, foxes, wolves, mongooses and other viverrids, mustelids and felines. Elsewhere skunks, raccoons, foxes and insectivorous bats are important in North America and the Caribbean; foxes, wolves, raccoon-dogs and insectivorous bats in Europe; wolves, jackals, mongooses and civets in Africa; flying foxes and insectivorous bats in Australia.

In Bangladesh, no accurate statistical data on rabies are collected, but scattered hospital records suggest that about 16000 cases were hospitalized during the last 4 years of the last century. A more recent estimate was of 1550 deaths/year. Although many people are aware of rabies, animal bites are often neglected and post-exposure prophylaxis (PEP) is not sought. It is estimated that about 58,000 animal bites occur each year. At least 22% of them are from rabid animals mostly dogs.

Rabies is a viral disease that causes acute encephalitis (inflammation of the brain) in warm-blooded animals. It is zoonotic (i.e., transmitted by animals), most commonly by a bite from an infected animal. For a human, rabies is almost invariably fatal if post-exposure prophylaxis is not administered prior to the onset of severe symptoms. The rabies virus infects the central nervous system, ultimately causing disease in the brain and death.

The rabies virus travels to the brain by following the peripheral nerves. The incubation period of the disease is usually a few months in humans, depending on the distance the virus must travel to reach the central nervous system.^[2] Once the rabies virus reaches the central nervous system and symptoms begin to show, the infection is effectively untreatable and usually fatal within days.

Early-stage symptoms of rabies are malaise, headache and fever, progressing to acute pain, violent movements, uncontrolled excitement, depression, and hydrophobia.^[1] Finally, the patient may experience periods of mania and lethargy, eventually leading to coma. The primary cause of death is usually respiratory insufficiency. Worldwide, roughly 97% of rabies cases come from dog bites. In the United States, however, animal control and vaccination programs have effectively eliminated domestic dogs as reservoirs of rabies. In several countries, including Australia, Japan, and the United Kingdom, rabies carried by animals that live on the ground has been eradicated entirely.

Signs and symptoms

The period between infection and the first flu-like symptoms is normally two to twelve weeks, but can be as long as two years. Soon after, the symptoms expand to slight or partial paralysis, cerebral dysfunction, anxiety, insomnia, confusion, agitation, abnormal behavior, paranoia, terror, hallucinations, progressing to delirium. The production of large quantities of saliva and tears coupled with an inability to speak or swallow are typical during the later stages of the disease; this can result in hydrophobia, in which the patient has difficulty swallowing because the throat and jaw become slowly paralyzed, shows panic when presented with liquids to drink, and cannot quench his or her thirst.

Death almost invariably results two to ten days after first symptoms. In 2005, the first patient was treated with the Milwaukee protocol, and Jeanna Giese became the first person ever recorded to survive rabies without receiving successful post-exposure prophylaxis. An intention to treat analysis has since found that this protocol has a survival rate of about 8%.

Diagnosis

The reference method for diagnosing rabies is by performing PCR or viral culture on brain samples taken after death. The diagnosis can also be reliably made from skin samples taken before death. It is also possible to make the diagnosis from saliva, urine and cerebrospinal fluid samples, but this is not as sensitive. Cerebral inclusion bodies called Negri bodies are 100% diagnostic for rabies infection, but are found in only about 80% of cases. If possible, the animal from which the bite was received should also be examined for rabies.

The differential diagnosis in a case of suspected human rabies may initially include any cause of encephalitis, in particular infection with viruses such as herpesviruses, enteroviruses, and arboviruses (e.g., West Nile virus). The most important viruses to rule out are herpes simplex virus type 1, varicella-zoster virus, and (less commonly) enteroviruses, including coxsackieviruses, echoviruses, polioviruses, and human enteroviruses 68 to 71.

New causes of viral encephalitis are also possible, as was evidenced by the recent outbreak in Malaysia of some 300 cases of encephalitis (mortality rate, 40%) caused by Nipah virus, a newly recognized paramyxovirus. Likewise, well-known viruses may be introduced into new locations, as is illustrated by the recent outbreak of encephalitis due to West Nile virus in the eastern United States. Epidemiologic factors (e.g., season, geographic location, and the patient's age, travel history, and possible exposure to animal bites, rodents, and ticks) may help direct the diagnostic workup.

Cheaper rabies diagnosis will become possible for low-income settings: accurate rabies diagnosis can be done at a tenth of the cost of traditional testing using basic light microscopy techniques.

Prevention

All human cases of rabies were fatal until a vaccine was developed in 1885 by Louis Pasteur and Émile Roux. Their original vaccine was harvested from infected rabbits, from which the virus in the nerve tissue was weakened by allowing it to dry for five to ten days. Similar nerve tissue-derived vaccines are still used in some countries, as they are much cheaper than modern cell culture vaccines. The human diploid cell rabies vaccine was started in 1967; however, a new and less expensive purified chicken embryo cell vaccine and purified vero cell rabies vaccine are now available. A recombinant vaccine called V-RG has been successfully used in Belgium, France, Germany, and the United States to prevent outbreaks of rabies in wildlife. Currently pre-exposure immunization has been used in both human and non-human populations, whereas in many jurisdictions domesticated animals are required to be vaccinated.

In the USA, since the widespread vaccination of domestic dogs and cats and the development of effective human vaccines and immunoglobulin treatments, the number of recorded deaths from rabies has dropped from one hundred or more annually in the early 20th century, to 1–2 per year, mostly caused by bat bites, which may go unnoticed by the victim and hence untreated.

The Missouri Dept. of Health and Senior Services Communicable Disease Surveillance 2007 Annual Report states that the following can help reduce the risk of exposure to rabies:

- Vaccinating dogs, cats, and ferrets against rabies
- Keeping pets under supervision
- Not handling wild animals or strays
- Contacting an animal control officer, if you see a wild animal or a stray, especially if the animal is acting strangely.
- Washing the wound with soap and water between 10 to 15 minutes, if you do get bitten by an animal, and contacting your healthcare provider to see whether you need rabies post-exposure prophylaxis.
- Getting pets spayed or neutered. Pets that are sterile are less likely to leave home, become strays, and reproduce more stray animals.

September 28 is World Rabies Day, which promotes information on, and prevention and elimination of the disease.

Directorate of health services (DGHS) started to sterilize the street dog to limit their breeding. That was a helpful step to save our people from dog bites. But unfortunately the program has been suspended for last 2 years and incidence of dog bite went up and as so rabies.

Management

Post-exposure prophylaxis

Treatment after exposure, known as post-exposure prophylaxis (PEP), is highly successful in preventing the disease if administered promptly, in general within ten days of infection. Thoroughly washing the wound as soon as possible with soap and water for approximately five minutes is very effective in reducing the number of viral particles. "If available, a virucidal antiseptic such as povidone-iodine, iodine tincture, aqueous iodine solution, or alcohol (ethanol) should be applied after washing. Exposed mucous membranes such as eyes, nose or mouth should be flushed well with water."

In the United States, the Centers for Disease Control and Prevention (CDC) recommend patients receive one dose of *human rabies immunoglobulin* (HRIG) and four doses of rabies vaccine over a fourteen-day period. The immunoglobulin dose should not exceed 20 units per kilogram body weight. HRIG is very expensive and constitutes the vast majority of the cost of post-exposure treatment, ranging as high as several thousand dollars. As much as possible of this dose should be infiltrated around the bites, with the remainder being given by deep intramuscular injection at a site distant from the vaccination site. The first dose of rabies vaccine is given as soon as possible after exposure, with additional doses on days three, seven and fourteen after the first. Patients who have previously received pre-exposure vaccination do not receive the immunoglobulin, only the post-exposure vaccinations on day 0 and 2.

Modern cell-based vaccines are similar to flu shots in terms of pain and side-effects. The old nerve-tissue-based vaccinations that require multiple painful injections into the abdomen with a large needle are cheap, but are being phased out and replaced by affordable World Health Organization (WHO) intradermal (ID) vaccination regimens.

Intramuscular vaccination should be given into the deltoid, not gluteal area, which has been associated with vaccination failure due to injection into fat rather than muscle. In infants, the lateral thigh is used as for routine childhood vaccinations.

Awakening to find a bat in the room, or finding a bat in the room of a previously unattended child or mentally disabled or intoxicated person, is regarded as an indication for post-exposure prophylaxis. The recommendation for the precautionary use of post-exposure prophylaxis in occult bat encounters where there is no recognized contact has been questioned in the medical literature, based on a cost-benefit analysis. However, recent studies have further confirmed the wisdom of maintaining the current protocol of precautionary administering of PEP in cases where a child or mentally compromised individual has been left alone with a bat, especially in sleep areas, where a bite or exposure may occur while the victim is asleep and unaware or awake and unaware that a bite occurred. This is illustrated by the September 2000 case of a nine-year-old boy from Quebec who died from rabies three weeks after being in the presence of a sick bat, even though there was no apparent report of a bite, as shown in the following conclusion made by the doctors involved in the case:

Despite recent criticism, the dramatic circumstances surrounding our patient's history, as well as increasingly frequent reports of human rabies contracted in North America, support the current Canadian guidelines that state that RPEP [PEP] is appropriate in cases

where a significant contact with a bat cannot be excluded (45). The notion that a bite or an overt break in the skin needs to be seen or felt for rabies to be transmitted by a bat is a myth in many cases.

It is highly recommended that PEP be administered as soon as possible. Begun with little or no delay, PEP is 100% effective against rabies. In the case in which there has been a significant delay in administering PEP, the treatment should be administered regardless of that delay, as it may still be effective.

Prognosis

Treatment after exposure (receiving the vaccines), known as post-exposure prophylaxis (PEP), is highly successful in preventing the disease if administered promptly, in general within ten days of infection. Begun with little or no delay, PEP is 100% effective against rabies.^[8] In the case in which there has been a significant delay in administering PEP, the treatment should be administered regardless of that delay, as it may still be effective.

In unvaccinated humans, rabies is usually fatal after neurological symptoms have developed, but prompt post-exposure vaccination may prevent the virus from progressing. Rabies kills around 55,000 people a year, mostly in Asia and Africa.

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