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Rabies; A Potential Human Threat

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ABSTRACT

Rabies is an acute viral and fatal disease of carnivores, bats and also of mammals. It is zoonotic disease. Rabies transmit mostly by rabid bites. Rabies causes central nervous system disorder. Diagnosis is based on the clinical signs and symptoms with history of dog bite and laboratory tests are also required for conformation. Vaccination of dogs and wild animals against rabies prevents its transmission. In rabies mostly supportive treatment is given to patient but two type of treatment (Pre exposure treatment and post exposure treatment) are also given to healthy and infected individual. Rabies cause infection in most of the developing countries of Asia. In most of the Europe countries rabies has been eradicated due to their strict policies and vaccinations. In poor counties of Africa rabies has high death ratio and mostly affecting children and rural community.

Introduction & Background:

Rabies is a progressive, acute vial encephalomyelitis which effects carnivores and bats, but the disease can also occur in mammals. Rabies become a fatal disease once the clinical signs appear. This disease found throughout the world. The disease is of zoonotic importance. Reported animals which are the cause of Rabies include Dogs, Racoons, Bats, foxes and skunks. Dogs are vaccinated against Rabies in western and eastern countries, but it is not under control yet. Animal or Human can get infection through rabid bites, non-bites exposure and human to human transmission. Rabid bites are the most common transmission route while the other two are rare. Genus lyssa of Rhabdoviridae family is the main cause of this disease [1]. It is subdivided into 7 genotypes based on RNA sequencing. Genotype 1 is found throughout the world (Classical rabies virus), Genotypes 2,3 and 4 are mostly found in Africa (Lagos bat virus, Mokola virus, Duvenhage virus respectively), Genotypes 5 and 6 are mostly found in Europe (European bat lyssavirus 1, European bat lyssavirus 2 respectively) and Genotype 7 can be seen in Australia (Australian bat lyssavirus). Domestic dogs play vital role in the transmission of rabies, 85-90% of rabies cases which are reported in the humans are due to dog bites. This is due to the close relation of humans with dogs. According to the report of world health organization over 10 million people are being bitten by the animals and need treatment of rabies. Out of 10 million infected people about fifty-five thousand people died every year [2]. Rabies in humans cause 100% mortality. Rabies causes central nervous system disorder with the other signs and symptoms which include headache, fever, flu, and paralysis which ultimately leads to death. Vaccination of dogs and wild animals are used to prevent rabies virus to spread, and vaccines proved quite helpful in reducing the transmission of rabies.

Diagnosis of Rabies:

In case of human rabies, diagnosis can be made based on the clinical signs and symptoms with a history of a dog bite and no record of vaccination or incomplete vaccination. It is classified into 3 stages 1. prodromal, 2. furious or excitement and 3. paralysis. But it is not compulsory that all three stages are present in a single individual. Neuropathic pain is the first clinical symptom, due to the replicating virus at the site of infection. In some cases, no clinical sign can be seen but sudden death. In case of animals, rabies is diagnosed by taking the infected part of the brain but to confirm rabies we must take the tissues from 2 different locations of the brain that are cerebellum and brain stem [3]. The tissues can also be taken from hippocampus, cortex and medulla oblongata. Immunofluorescence microscopy is the test of choice for fresh brain tissues. Clinical signs-based diagnoses must not be used for the public health decisions. This is because in the early stages of rabies it can be confused with other diseases or with the animals having aggressive behavior, therefore a confirm laboratory test after the postmortem or definitive diagnosis is required. Tests can be performed on serum, saliva and the skin sample of the hair follicles taken from the neck region.

Prevention and treatment:

There is not any proper treatment for rabies is available only supportive treatment is given to the patient. But it can be prevented by giving rabies immune globin shot or maybe other rabies vaccine. Rabies immune globin shot is given at the site of bite or infection instantly after the bite or attack of the animal so that the latent symptoms might not develop and can be prevented from the serious disease or prevent mortality. No treatment or no prevention cause 100% mortality. Two types of treatments are used including pre-exposure treatment or prevention and post exposure treatment. Pre exposure prevention include the treatment or vaccination of the people which are much likely to get exposed to the virus that are veterinarians, animal caretakers, lab workers and international travelers which are at great risk to get infected with virus from any infected area. While post exposure treatment include the treatment of the patients which are attacked or being bitten by the rabid animal, in this case the scratches or wounds should be washed properly with soap and water so that the chances of infection should be decreased. Rabies immune globin shot is given following 5 shots of rabies vaccine within a period of 28 days.

Rabies in Asia:

Rabies cause infection in most of the developing countries of Asia. According to the World Health Organization report, Rabies cause over 30,000 deaths per year in Asia. 15% of the mortality occurs in young ones under the age of 15, while more than 3 billion people are getting exposed to the Rabies virus. In 2004 most deaths are reported in India while lowest death reports in Magnolia and Cambodia [4]. In 1985, deaths due to rabies in India are 25,000-30,000 while the number of dogs bitten cases were about 15 million. After so many precautions the numbers are decline to 20,585 per year. More than 3,000 cases reported in China in 2006 and 2007 while a massive decline in 2008 as only 205 cases reported [5]. Nepal has reported the most deaths due to Rabies in the World. About 200 people die in Nepal per year and 35,000 street dogs are reported. In 2009, 3,000 deaths occur out of 100,000 reported cases in Bangladesh. Pakistan is likewise dealing with a potentially dangerous rabies crisis. 9 million rabies cases reported only in Karachi (largest city of Pakistan) as 25-30 new cases reported daily at Civil Hospital Karachi. Some countries in Asia are stated to be Rabies free countries including Bahrain, Hong Kong, Japan, Maldives, Cyprus, Malaysia, Singapore, Timor-Leste, Lakchyadeep, Qatar, Andaman and Nicobar Islands of India.

Rabies in Europe:

It is stated that human Rabies has been eradicated in most of the European counties but still present in Europe. Extermination of Rabies in Europe is due to their strict policies and enforced vaccinations [6]. Rabies free countries in Europe include Finland, Greece, Isle of Man, Norway (except Svalbard and isl.), Spain (except centa + Melill), Albania, Gibraltar, E.Y.R. of Macedona, Iceland, Malta, Portugal and United Kingdom.

Rabies in Africa:

Rabies has high death ratio in poor African countries mostly affecting children and rural community. 24,000 deaths reported annually in Africa [7]. Rabies was first confirmed in 1928 in South Africa before that unverified epidemic of Rabies was reported in 1901 in western Zambia. High risk countries are Zimbabwe, Angola, Namibia and Mozambique while Rabies free countries are Libya, Congo, Mauritius, Seychelles, Reunion and Cape Verde.

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