

Human rabies: really 100% fatal?

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Opinion

Rabies virus is a single-stranded, rod- or bullet-shaped, and negative-sense, unsegmented, enveloped ribonucleic acid (RNA) virus with five-protein encoding viral genome. A human rabies virus, strain H-08-1320, from Sri Lanka was complete genome sequencing which indicated that this strain formed an independent lineage and did not cluster with rabies viruses from other countries. In the past, at least 7 cases of rabies were recovered from rabies, for example, an American female case with rabies-positive neck skin. This virus is classified in family "Rhabdoviridae" that consists of more than 100 single-stranded viruses and can infect vertebrates, invertebrates, and plants. Rabies has been recognized for more than 4,000 years. Currently, rabies disease is identified in most countries except naturally unreported regions, such as Australian islands. Approximately, 60,000 human rabies deaths occur annually, whereas more than 15 million individuals receive post-exposure prophylaxis every year. Countries with hyperendemic canine rabies, such as Asia, Africa, and Latin America are at the highest risk of rabies. During the 1940-50s, domestic animal rabies in the United States and Europe was largely controlled. The incubation period is 2-3 months by average after animal bites and death occurs within 2 weeks after the presentation of the clinical manifestations. Four out of every 10 deaths due to rabies are in younger children of less than 15 years old. About 40 % of children aged 5-14 years in Asia and Africa receive post-exposure prophylaxis, whereas male patients are the majority of treated cases. Nonbite exposures can occur via mucosal contact, but rarely cause human rabies. The clinical symptoms are often nonspecific. The direct immunofluorescence test is the most sensitive and specific method for detecting rabies antigen in the fresh tissue, including skin and brain. The detection of rabies virus-neutralizing antibody performed by rapid fluorescence focus inhibition test (RFFIT) in the serum of unvaccinated persons is also diagnostic. The presence of rabies virus neutralizing antibody in the cerebrospinal fluid is the confirmed diagnosis, but the antibody may appear 2-3 days later than the serum antibody. Post-exposure prophylaxis is promptly and necessary which consists of the combination of local wound cleansing, rabies vaccine, and human rabies immune globulin (HRIG). Interferon-gamma,

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ketamine, and ribavirin are specific therapies. Currently, human diploid cell vaccine (HDCV) and rabies vaccine adsorbed (RVA) are the two cell culture products that are licensed in the United States.

Conclusion

Mass dog and cat vaccination programs should be performed in the rabies endemic areas that successfully reduced rabies in canine and humans in the United States and Europe. Combination therapy may be superior to single agent therapy.

Acknowledgments

None.

Conflicts of interest

None.