Rabies

Infection Control in Healthcare Personnel: Epidemiology and Control of Selected Infections Transmitted Among Healthcare Personnel and Patients (2024)

AT A GLANCE

Rabies from the Infection Control in Healthcare Personnel: Epidemiology and Control of Selected Infections Transmitted Among Healthcare Personnel and Patients (2024) guideline.

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Recommendations

1. For healthcare personnel who have an exposure to rabies virus, administer postexposure prophylaxis in accordance with CDC and ACIP recommendations and in consultation with federal, state, and local public health authorities.

2. Work restrictions are not necessary for asymptomatic healthcare personnel who have an exposure to rabies virus.

3. For healthcare personnel who have a suspected or confirmed rabies virus infection, exclude from work in consultation with federal, state, and local public health authorities.

Background

Healthcare-associated transmission of rabies virus has been documented between patients, although occupational transmission to HCP has not been confirmed [1]. Person to person transmission of rabies is rare and has been reported almost exclusively via cornea, tissue, and organ transplantation [2] [3] [4] [5] [6] [7].

Guidelines for rabies vaccination of certain high-risk groups (e.g., persons who perform rabies laboratory diagnostic testing, those who frequently enter high density bat environments, and persons who work with potentially rabid mammals) are maintained by the Advisory Committee on Immunization Practices (ACIP) and described in Human Rabies Prevention — United States, 2008 Recommendations of the Advisory Committee on Immunization Practices (cdc.gov) (https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5703a1.htm), with updates posted on the ACIP Vaccine Recommendations and Schedules | CDC website (https://www.cdc.gov/vaccines/acip/recommendations.html). [8] Additional information regarding preexposure rabies vaccination is available on the CDC Rabies Preexposure Vaccinations website (https://www.cdc.gov/rabies/specific_groups/travelers/pre-exposure_vaccinations.html). [9]

Prevention of transmission of rabies in healthcare settings involves:

a. using Standard Precautions, that may include a gown, gloves, eye protection and a facemask, for patients with suspected or confirmed clinical infection, to prevent contact with potentially infectious body fluids and secretions;

b. rapidly diagnosing patients with clinical infection;

c. appropriately administering postexposure prophylaxis (PEP) to persons exposed to rabies virus; and

d. excluding potentially infectious HCP from work.

Use of appropriate personal protective equipment is a critical part of Standard Precautions that prevents exposures among HCP and the need for PEP. Adherence to standard precautions includes wearing gowns, gloves, a facemask, and eye protection when contact with patient secretions is possible, such as during intubation, suctioning of airways, and other common patient care activities.

Occupational Exposures

Rabies virus is transmitted through direct contact (e.g., through broken skin or mucous membranes in the eyes, nose, or mouth) with saliva, tears and lacrimal secretions, or brain/nervous system tissue from an infected animal or person [10]. Bite and non-bite (e.g., cerebrospinal fluid, brain tissue) occupational exposures from an infected person could theoretically transmit rabies to HCP, but no such cases have been confirmed. Casual contact, such as touching a person with rabies or contact with non-infectious fluid or tissue (e.g., urine, blood, feces), is not associated with a risk for infection. Rabies virus is not transmitted through contaminated objects or materials such as clothes or bedding [11].

An exposure to rabies virus in a healthcare setting could include being bitten by a potentially infectious patient, or having a patient's saliva come into contact with a person's eyes, mouth, or an open cut on the skin. Contact with wildlife on a healthcare facility's premises, or in the community, remains possible, and HCP may have exposures outside the United States (https://wwwnc.cdc.gov/travel/yellowbook/2020/travel-related-infectious-diseases/rabies) [12] that are addressed by occupational health services upon their return. Occupational Health Services typically contact state public health officials for assistance in determining the likelihood of a rabies exposure in a specific situation before initiating post-exposure prophylaxis [8].

Laboratory safety, exposures to rabies, and prevention in laboratory settings are described in Biosafety in Microbiological and Biomedical Laboratories (BMBL), 6th Edition (https://www.cdc.gov/biosafety/publications/bmbl5/index.htm). [13]

Clinical Features

Rabies onset is characterized by a non-specific prodrome that could be mistaken for other diseases. The first symptoms of rabies may be very similar to those of an influenza-like illness, including general weakness or discomfort, fever, or headache. These symptoms may last for days. There may also be discomfort or a prickling or itching sensation at the site of an initial bite, progressing within days to symptoms of cerebral dysfunction, anxiety, confusion, autonomic instability, and agitation. As the disease progresses, the person may experience delirium, abnormal behavior, hallucinations, hydrophobia (fear of water), dysphagia, and insomnia. Occasionally, rabies may present as a paralytic syndrome [14] [15].

The acute period of disease typically ends after 2 to 10 days. Once clinical signs of rabies appear, the disease is nearly always fatal, and treatment is typically supportive [14]. Among those without a history of receiving pre- or postexposure prophylaxis, less than 10 documented cases of human survival from rabies have been reported; the majority have had significant lifelong neurological deficits.

The incubation period may vary based on the location of the exposure site (how far away it is from the brain), the type of rabies virus, and any existing immunity [14]. In humans, the incubation period averages 1 to 3 months but ranges from days to years [16] [17].

Testing and Diagnosis

Patient history is important to identify a possible exposure to rabies and other encephalitides; in the absence of a possible exposure to rabies, more common causes of encephalitis (e.g., Herpes Simplex Virus, Varicella-Zoster Virus) are typically ruled-out before rabies is considered. However, rabies, for example from an unrecognized bat bite, could be a consideration in the absence of definite exposure history when a work-up has not yielded an etiology [18].

Several ante-mortem tests are necessary to diagnose rabies in humans; no single test is sufficient to rule out rabies in a living person. Antemortem tests are performed on samples of saliva, serum, spinal fluid, and nuchal skin biopsies that include hair follicles at the nape of the neck. Saliva can be tested by real-time reverse transcription polymerase chain reaction. Serum and spinal fluid are tested for neutralizing and non-neutralizing antibodies to rabies virus. Skin biopsy specimens are examined for rabies antigen in the cutaneous nerves at the base of hair follicles by antigenic and molecular testing methods [19]. Interpretation of rabies virus serology can be confounded in persons with a history of rabies vaccination or those who have received human rabies immune globulin within the last 14 days; a positive serological test, alone, must be accompanied with a thorough medical history to rule out these confounders.

Additional information about testing for rabies may be found on the CDC Rabies website (https://www.cdc.gov/rabies/index.html). [20]

Postexposure Prophylaxis

The purpose of PEP is to prevent the rabies virus from establishing infection in the neural tissue of the host, and decisions about administration are usually made on a case-by-case basis after discussion with public health authorities. Contact information for consulting with state public health authorities is located on the National Association of State Public Health Veterinarians website (http://www.nasphv.org/Documents/StatePublicHealthVeterinariansByState.pdf). [21]

HCP who report an exposure to rabies may be offered PEP depending on the nature of the exposure [16]. In addition to PEP, all affected wounds should be washed promptly to reduce the amount of virus that may remain present in the wound [8] [16]. Prophylaxis, when indicated, should begin as soon as possible after exposure.

Routine delivery of healthcare to a patient with rabies, without an exposure that could result in transmission, is not an indication for PEP. Additional detail regarding PEP for rabies is provided on the CDC Rabies Vaccine website (https://www.cdc.gov/rabies/medical_care/vaccine.html). [22] [23] [24] [25]

Abbreviations

- ACIP = Advisory Committee on Immunization Practices
- CDC = Centers for Disease Control and Prevention
- HCP = Healthcare Personnel
- PCR = Polymerase Chain Reaction
- PEP = Postexposure Prophylaxis
- PPE = Personal Protective Equipment
- Tdap = Tetanus, Diphtheria, Pertussis

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