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Popular Article

Rabies: A zoonotic threat

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Introduction

Zoonoses are defined as those diseases and infections naturally transmitted between peoples and vertebrate animals. It is estimated that globally, about one billion cases of illness and millions of deaths occur every year from zoonoses and about 60% of emerging infectious diseases that are reported globally are zoonoses. Over 30 new human pathogens have been detected in the last three decades, 75% of which have originated in animals.

There are over 200 known types of zoonoses, which comprise a large percentage of new and existing diseases in humans. Rabies is a zoonotic disease which is 100 per cent preventable through vaccination and other methods. Zoonotic pathogens may spread to humans through direct contact or through food, water or the environment and represent a major public health problem around the world.

Etiology

Rabies is a zoonosis (disease transmitted to humans by animals) caused by a virus belong to family Rhabdoviridae that affects domestic and wild animals and spreads to people through contact with infected saliva through bites or scratches. The word Rabies is derived from the Latin word “**rabere**” which means “to be mad”. Rabies is present on all continents except Antarctica, but more than 95% of human deaths are recorded in Asia and Africa. It causes tens of thousands of deaths every year, mainly in Asia and Africa, 40% of whom are children under 15 years of age. Virus is carried by warm-blooded animals (mammals) and collects in their saliva. Virus is most commonly found in bats, skunks, raccoons and foxes, but other animals including pet dog, cat and other animals.

Mode of Transmission:

Rabies virus (RABV) is transmitted through direct contact (such as through broken skin or mucous membranes of eyes, nose, or mouth) with saliva or brain/nervous system tissue from an infected animal. It can spread to people and pets if they are bitten or scratched by a rabid animal. However, in many other countries dogs still carry rabies, and most rabies deaths in people around the

world are caused by dog bites. Rabies is one of the 17 chief discounted tropical diseases. Hence it is a discounted zoonotic sickness so its regulation is tougher and is widespread in most of the world.

Symptoms- Rabies developments in five different stages:

1. Incubation
2. Prodrome
3. Acute neurologic period
4. Coma and death.

- 1. Incubation:** This is the time earlier than signs appear. It normally persists from three to twelve weeks; however, it can take as low as five days or extra than 2 years. The nearer the chew is to the brain, the earlier the outcomes are probably to appear. By the time signs appear, rabies is normally fatal. Anyone who may also have been uncovered to the virus ought to be seeking clinical assist at once, without awaiting signs.
- 2. Prodrome:** During the prodrome level of rabies, someone might also additionally revel in coughing and fever. Early, flu-like symptoms, including a fever of 100.four stages Fahrenheit (38 stages Celsius) or above headache, nervousness, feeling normally unwell, sore throat and a cough, nausea, and vomiting and soreness might also additionally arise on the web website online of the bite. These can close from two to ten days, and that they get worse over time.
- 3. Acute neurologic period:** Neurologic signs and manifestations create, including: disarray a lot, halfway loss of motion, compulsory muscle jerking, and unbending neck muscles, spasms, hyperventilation, and issue in breathing, hyper salivation or delivering a whole part of salivation, and likely foaming at the mouth, the worry of water, or hydrophobia, because of issue swallowing, mental trips, bad dreams, and sleep deprivation, priapism, photophobia, or a dread of light. Around the apex of this stage, breathing turns quick and conflicting
- 4. Coma and death:** If the person enters a coma, death will occur within a matter of hours, unless they are attached to a ventilator. Rarely, a person may recover at this late stage.

Treatment and Control

There's no approved treatment for rabies. After a potential exposure of people to a rabid animal, they can seek post-exposure prophylaxis (PEP), which consists of immediate, thorough wound washing with soap and water for 15 minutes, a series of rabies vaccinations and if indicated, administration of rabies immunoglobulin or monoclonal antibodies, which can be life-saving. If an individual is bitten or scratched by an animal that may have rabies. This may limit the quantity of viral particles.

Post-exposure prophylaxis (PEP)

Post-exposure prophylaxis (PEP) is the emergency response to a rabies exposure. This prevents the virus from entering the central nervous system, which would invariably result in death. PEP consists of cleaning the wound gently but thoroughly with foamy water, povidone iodine, or



cleanser for 15 minutes and local treatment of the wound as soon as possible after a suspected exposure a course of potent and effective rabies vaccine that meets WHO standards and the administration of rabies immunoglobulin or monoclonal antibodies into the wound, if indicated.

Certain people with a higher risk for rabies exposures, such as those who work with potentially infected animals, are recommended to receive vaccine to help prevent rabies if an exposure happens.

If they are at higher risk of exposure to the rabies virus:

- They should receive 2 doses of rabies vaccine given on days 0 and 7.
- Depending on their level of risk, they may be advised to have one or more blood tests or receive a booster dose within 3 years after the first 2 doses.

Rabies vaccine can prevent rabies if given to a person after an exposure. After an exposure or potential exposure to rabies, the vaccine should be given as soon as possible after an exposure but may be effective any time before symptoms begin. Once symptoms begin, rabies vaccine is no longer helpful in preventing rabies. If people have not been vaccinated against rabies in the past, they need 4 doses of rabies vaccine over 2 weeks (given on days 0, 3, 7, and 14). They should also get another medication called rabies immunoglobulin on the day they receive the first dose of rabies vaccine or soon afterwards. If they have received rabies vaccination in the past, they typically need only 2 doses of rabies vaccine after an exposure. Rabies vaccine is available under the following different brand names: HDCV, Imovax, and rabies vaccine human diploid cell culture.

Human rabies immune globulin

Human rabies immune globulin (HRIG) is the Ig G fraction of plasma from human donors who have received multiple doses of rabies vaccine and have high levels of anti-rabies antibody. HRIG is administered once to previously unvaccinated individuals exposed to a rabid animal to provide rabies virus neutralizing antibody coverage until the patient responds to vaccination by actively producing virus-neutralizing antibodies. HRIG is administered once on day 0 at the time post exposure prophylaxis (PEP) is initiated, in conjunction with human rabies vaccine. If HRIG was not administered when vaccination was begun on day 0, it can be administered up to and including day 7 of the PEP series. If anatomically feasible, the full dose of HRIG is infiltrated around and into any wounds. Any remaining volume is injected intramuscularly at a site distant from vaccine administration. HRIG should not be administered in the same syringe or at the same anatomic site as the first vaccine dose. However, subsequent doses (i.e., on days 3, 7, and 14) of vaccine in the 4-dose PEP vaccine series can be administered in the same anatomic location in which HRIG was administered.

