Good example of prevention essay

Environment, Animals

Prevention is crucial when it comes to combating rabies. Luckily, it is also quite easy. Prevention is classified into two methods: primary and secondary.

Primary prevention: minimizing and avoiding exposure: One of the most vital steps in checking rabies is educating the endangered about sensible pet ownership as well as how they can avoid or minimize their rabies exposure. To begin with, dogs, cats and other pets must receive regular rabies vaccines. The conventional rabies vaccine was initially administered to dogs once annually, but desires to reduce vaccine frequency initiated the development of rabies vaccine that is now given once after a three-year interval. Animal vaccination clinics in addition to community awareness are important to deal with this disease and enhance human, as well as animal health all over the planet. Well executed prevention programs are the only successful efforts known to have reduced and eliminated rabies from household dog populations; this subsequently has been revealed to nearly eradicate cases of the deadly rabies virus amongst human.

Tips to remember are:-

- Do not let or allow your dog as well as other pets to get away from your sight, particularly in wooded quarters. This would increase their chances of encountering wild animals. Keep your pets, especially dogs on a leash
- If another domestic animal bites your pet, confer with your veterinarian straight away and ask the owner to make available proof of a recent rabies vaccination. If the animal does not have any vaccination proof, report the incident to your area animal control authority and make certain that the animal is quarantined aptly. Majority of animal control agencies along with

humane societies offer low-cost or sometimes free vaccinations.

- Incases your pet obtains a suspected wound from any unknown creature or if the pet comes in contact with a wild animal, consult your veterinarian right away, even if no wounds are evident .

- Supervise your children and educate them not to get close to or touch animals (domestic or wild) they do not recognize.

- Break away from any animal showing any signs of rabies. If you suspect the animal to be rabid, contact your local authorities immediately.

- If you live with or have pets, make sure they are regularly vaccinated against rabies.

Secondary prevention: hindering infection in its tracks: Thwarting the rabies virus in humans is equally vital. If one is bitten or scratched by any animal, either domestic or wild, he or she should consult their physician immediately. If the animal is a pet, demand a proof of a recent rabies vaccination. Bites to humans must be addressed instantly by a physician. If someone gets bitten by any animal showing rabid signs, it is possible to prevent the rabies virus if the victim quickly receives proper medical attention and treatment. The treatment – referred to as rabies postexposure prophylaxis, or simply PEP - entails immediately cleaning the bite wound(s) and receiving rabies immune globulin. These are pre-formed antibodies that immediately neutralize the rabies virus and preventing it from further spreading. After that one gets a cycle of vaccine doses. PEP is almost 100% effective in stopping rabies from multiplying and developing, if received correctly and immediately after exposure. In spite of this, although PEP has been available since the period

of Louis Pasteur, and enhanced since then, it continues to be unaffordable or unavailable in developing nations where communities are most at risk.

Cost of rabies prevention

While human rabies deaths are uncommon, the projected public health expenditure associated with detection, prevention, as well as control of the disease has gone up, exceeding $300 million yearly. These costs consist of the vaccination of pets, upkeep of rabies laboratories, animal control programs, and medical costs such as those acquired for rabies postexposure prophylaxis (PEP). Even though the cost varies, a program of rabies immune globulin (RIG) as well as 4 doses of vaccine administered over a 4-week period on average exceeds $1, 000. The cost for every individual life saved from rabies varies from about $10, 000 -$100 million, depending on the kind of the exposure and the possibility of rabies in a territory.

TREATMENT

Regrettably, there is no medicine or any effective treatment for the rabies virus. Animals with evident and advanced symptoms of rabies must be killed and gotten rid of. This is the only available option to avoid unnecessary pain and distress in the animal. This would also prevent further transmission of the virus to human beings and other domestic and wild animals.

Individuals exposed to rabies must undergo a postexposure prophylaxis (PEP). However, PEP is not effective in human beings after the symptoms are noted and become eminent. That is why the routine must be administered as soon as possible. As with animals, the virus is almost fatal once the signs start to show.

Worldwide, approximately 55, 000 people die from rabies every year. Practically all of these cases are due to bites gotten from rabid dogs in nations throughout Asia, Africa, and the Middle East. Kids are frequently most in danger for rabies. Rabies infection always progresses to death of the victim unless he or she receives timely medical care and post-exposure prophylaxis (PEP).

Observational surveys show that PEP is unanimously effective in preventing human rabies virus when administered quickly and appropriately. Of the nearly 55, 000 persons who die yearly of rabies globally, the majority either did not get any postexposure prophylaxis, received some formula of PEP (commonly without RIG) subsequent to extensive delays, or were administered postexposure prophylaxis according to procedures that deviated significantly from present ACIP or WHO recommendations. In the US, of the 27 human rabies instances reported in 2000--2008, none of the victims had any history of receiving PEP prior to illness. This is the most widespread situation for most human rabies fatalities in both developed and developing countries.

The rabies virus in dogs has been controlled otherwise eliminated in majority of the developed world, subsequently; the human rabies cases are very rare. However, in the developing nations, the disease is a major public health worry. Stray dog populations have become a major cause of rabies exposure. Lack of public consciousness about rabies, as well as sensible pet ownership, poor access to health care and high costs of rabies PEP are just but a few explanations as to why so many individuals die each year from rabies

VACCINATION

Postexposure Vaccinations (PEP)

Rabies postexposure vaccinations entail a dose of human rabies immune globulin (HRIG) along with 4 doses of rabies vaccine administered on the first day of the exposure, and then again on the third, seventh and fourteenth day. The vaccine is injected via a muscle, more often than not in the upper arm. The PEP vaccination is very effective at combating rabies if the victim receives it as soon as possible. If an individual has previously received postexposure (PEP) vaccinations or even preexposure vaccinations, only 2 doses of vaccine are needed, on the first day of exposure and then three days later. In this case, Human rabies immune globulin (HRIG) is not required. The doctor or the local health department will guide the victim through the process. For victims who have never received any vaccination against rabies, their postexposure anti-rabies vaccination involves administration of both the antibody and vaccine. This combination of HRIG and vaccine is given for both bite and non-bite exposures. All postexposure prophylaxis must begin with instant thorough cleansing of every wound with water and soap and. If available, a virucidal agent such as povidine-iodine solution is used to irrigate the wounds.

Preparation of Rabies Immune Globulin (Human)

HyperRAB® S/D

Solvent /Detergent Treated

Description

Rabies Immune Globulin (Human) — HyperRAB® S/D treated with solvent or detergent is a colorless to pale yellow or pink sterile solution of antirabies

immune globulin for intramuscular administration; it is preservative-free and latex-free. HyperRAB S/D is prepared by cold ethanol fractionation from the plasma of donors hyperimmunized with rabies vaccine. The immune globulin is separated from solubilized Cohn Fraction II. The Fraction II solution is adjusted to a final concentration of 0. 3% tri-n-butyl phosphate (TNBP) and 0. 2% sodium cholate. After the addition of solvent (TNBP) and detergent (sodium cholate), the solution is heated to 30°C and maintained at that temperature for not less than 6 hours. After the viral inactivation step, the reactants are removed by precipitation, filtration and finally ultrafiltration and diafiltration. HyperRAB S/D is formulated as a 15–18% protein solution at a pH of 6. 4–7. 2 in 0. 21–0. 32 M glycine. HyperRAB S/D is then incubated in the final container for 21–28 days at 20–27°C. The product is standardized against the U. S. Standard Rabies Immune Globulin to contain an average potency value

of 150 IU/mL. The U. S. unit of potency is equivalent to the international unit (IU) for rabies antibody.

The removal and inactivation of spiked model enveloped and non-enveloped viruses such as HIV-1, BVDV, PRV during the manufacturing process for HyperRAB S/D has been validated in laboratory studies. Significant removal of model enveloped and non-enveloped viruses is achieved at two steps in the Cohn fractionation process leading to the collection of Cohn Fraction II: the precipitation and removal of Fraction III in the processing of Fraction II + IIIW suspension to Effluent III and the filtration step in the processing of Effluent III to Filtrate III. Significant inactivation of enveloped viruses is achieved at the time of treatment of solubilized Cohn Fraction II with

TNBP/sodium cholate.

STORAGE: HyperRAB S/D should be stored under refrigeration (2–8°C, 36–46°F). Solution that has been frozen should not be used.

Preparation of Rabies Vaccine

IMOVAX® RABIES

WISTAR RABIES VIRUS STRAIN PM-1503-3M

Grown In Human Diploid Cell Cultures

Description

The Imovax® Rabies Vaccine produced by Sanofi Pasteur SA is a sterile, stable, freeze-dried suspension of rabies virus prepared from strain PM-1503-3M obtained from the Wistar Institute, Philadelphia, PA. The virus is collected from infected human diploid cells, MRC-5 strain, concentrated by ultrafiltration and is inactivated by beta-propiolactone. 1 dose of reconstituted vaccine contains less than 100 mg human albumin, less than 150 mcg neomycin sulfate and 20 mcg of phenol red indicator. Beta-propiolactone, a residual component of the manufacturing process, is present in less than 50 parts per million. The finished, freeze-dried vaccine is provided for intramuscular administration in a single dose vial containing no preservative. After reconstitution, immediately administer the full 1. 0 mL amount of vaccine. If it cannot be administered promptly, discard. The potency of one dose (1. 0 mL) of Imovax Rabies vaccine is equal 1 to or greater than 2. 5 international units of rabies antigen.

STORAGE: The freeze-dried vaccine is stable if stored in the refrigerator between 2°C and 8°C (35°F to 11 46°F). Do not freeze.

Adverse Reactions

Adverse reactions associated with rabies vaccines and immune globulins are not familiar. Latest vaccines in use today have fewer adverse reactions than earlier available vaccines. However, some reactions to rabies vaccine, such as redness, pain, swelling or itching at the site of injection have been reported. Hardly ever, symptoms such as nausea, headache, muscle aches, or even dizziness have been reported. Low-grade fever may be felt after injection of RIG. The vaccine must be given at the recommended intervals for best results

Post-vaccination Serologic Testing

All healthy individuals tested as per the ACIP procedures after completion of at least a four-dose routine of rabies PEP should show sufficient antibody response against rabies virus. As a result, no regular testing of healthy individuals completing PEP is needed to verify seroconversion. Once titers are obtained, the serum samples collected 1--2 weeks following prophylaxis (after the final dose of vaccine) should totally neutralize any challenge rabies virus at least at a 1: 5 serum dilution by the rapid fluorescent focus inhibition test (RFFIT). The rabies virus-neutralizing antibody titers will fall gradually from the time of the last vaccination.

Warnings

Rabies Immune Globulin (Human) — HyperRAB® S/D is made from human plasma. And just like other Products made from human plasma, it may have infectious elements, such as viruses. The threat that such products will spread any infectious agent has been decreased by screening plasma donors

for any prior exposure to particular viruses, by analyzing for the occurrence of certain present virus infections, as well as by inactivating or removing specific viruses. Regardless of these measures, human plasma products are still capable of potentially transmitting diseases. Persons who receive infusions of plasma products or blood may acquire signs or symptoms of a number of viral infections, mostly hepatitis C. EVERY infection considered by a physician probably to have been transmitted by Rabies Immune Globulin should be reported by the physician. The physician must discuss the risks and advantages of this product with the patient, prior to administering it to the patient.

As with every preparations dispensed by the intramuscular means, complications especially bleeding may be encountered with patients suffering from thrombocytopenia or any other bleeding disorders.

PRECAUTIONS

General

HyperRAB S/D should not be given intravenously due to the potential for severe reactions. Even though systemic reactions associated with immunoglobulin preparations are uncommon, epinephrine should be offered for treatment of severe anaphylactoid symptoms.

Drug Interactions

Continual doses of HyperRAB S/D should not be administered after vaccine treatment has been commenced as this could thwart the full expression of effective immunity expected from the vaccine. Consequently, immunization

with active vaccines must not be given inside 3 months following HyperRAB S/D administration.

Pregnancy Category C

Animal reproduction surveys have not been carried out with HyperRAB S/D. In addition, it is not yet established whether HyperRAB S/D is capable of causing fetal impairment when administered to a pregnant woman or even if it can affect reproduction ability. HyperRAB S/D should only be administered to a pregnant woman if extremely needed.