

Rabies Awareness

CONTENTS

Sr No.	Topics	Page No.
1	What is Rabies and its Etiology (cause)	2
2	Transmission mechanism and sources of Transmission.	2
3	Signs and symptoms in case of Rabies	2
4	Identification of rabid animals	3
5	Pre-exposure prophylaxis/ vaccination	4
6	Post-exposure prophylaxis (PEP)	5
7	How to avoid dog bites and prevent Rabies	5
8	Challenges in Preventing Rabies	7
9	One Health and Rabies	7
10	Role of a Veterinarian in Preventing Rabies	8
11	Importance of Rabies awareness	9
12	Methods of rabies awareness for farmers	9
13	Role of a Veterinarian in Rabies Awareness	10
14	Current Status of Rabies Disease in Pakistan	10
15	Current Scenario of Rabies in the World	11
16	Importance of Rabies Day	12
17	Who is/are at risk in case of rabies?	12

1. What is Rabies and its Etiology (cause).

Rabies:

The rabies is a well-known viral disease that affects the central nervous system of all warm-blooded animals including human. The rabies is a zoonotic disease (can be transmitted from animal to human & vice versa) and causes fatal encephalitis in mammals. For Example, if a rabid dog bites a man, it can transfer the virus and disease to that man. Rabies is one of the fatal diseases on earth and you will have a 99.9% chance of dying, if you do not get treatment instantly after getting infected.

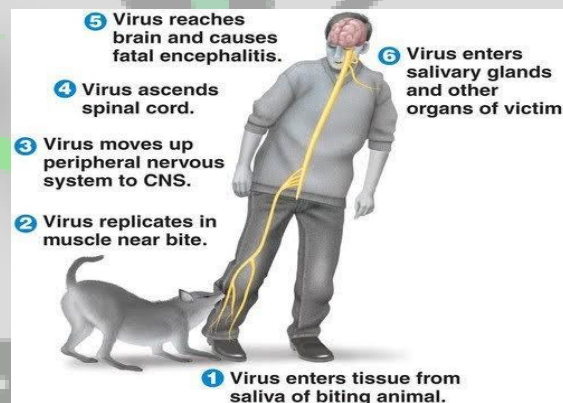
Etiology (Cause):

The causative agent of rabies is the *Lyssavirus* that belongs to the *Rhabdoviridae* family. It is a bullet shaped virus, containing a single-stranded anti-sense, non-segmented RNA. Saliva of rabid animal is main source of virus transmission.

2. Transmission mechanism and sources of Transmission

The Lyssavirus mostly present in saliva of infected animal and can be transmitted through the saliva of an infected animal due to biting, wounds or un-wrap cuts in fur or mucous membranes of body.

The Lyssavirus enters the body via wound or by direct contact with mucosal membranes. The rabies virus multiplies inside the bitten muscle or tissue and then it moves towards the central nervous system. The rabies virus moves 08 mm in a day and its infection depends on the site of biting to reach to the nervous system. The virus moves towards brain via peripheral nerves, after reaching the brain the same virus moves towards salivary glands through peripheral nerves. Biting of rabid animal near to head is fatal, leads to earlier death.



How do people and animals get the disease?

Humans can get rabies if an infected animal bites, licks or scratches them. In fact, someone can get the disease if the saliva from an infected animal gets enter into his/her body through any opening, cut or wound. For example, if saliva gets enter into your eye then you will get rabies.

Can food be source of rabies transmission?

There are no knowledge base documented cases of rabies transmission by drinking the raw milk of an animal that has rabies. However, drinking raw (unpasteurized) milk and raw milk products from a rabid animal is considered to be a risk.

3. Signs and symptoms in case of Rabies

If rabies is developed in animals specially dogs, there are following signs which may appear in them.

- First sign of rabies in the animals especially dogs is change in behaviour. Even normal can show aggressive behaviour or an active animal may become depressed.
- Animal seems as restless, aggressive or may be confused.
- Rabid animal shows strange behaviour like it may try to bite the air and moves in circles and looks tamed in front of strangers (Furious form).
- Animal tries to bite everything even non-food items.
- The voice of the animal is also changed especially pitch and tone
- Hyper-salivation (salivation increases).
- Animal tries to eat things like stones and dirt.
- Animal may become paralyzed either partially or fully(Paralytic form)
- Hydrophobia is not developed in dogs.
- There may be pica, muscular lack of coordination or may be dropped jaw.

If rabies is developed in humans then there are following signs appear in them.

- First sign of rabies in humans is pain or itching at biting site in most of the cases.
- There is fever, restlessness, headache which may go for 2–4 days.
- Main sign in humans is hydrophobia (fear of water)
- Person cannot tolerate noise and bright light.
- Infected person develop fear of impending death
- He or she may become depressed, anger or also develops irritability.
- At late stage of disease if you take water to the infected person it may provoke spasms in the neck and throat.
- There is excessive sweating.
- Muscles become paralyzed with the passage of time, initially at the site of bite.
- Patient gradually go into coma and death may occur.

4. Identification of rabid animals

Due to the serious nature of the rabies virus, proper identification of infected animals is extremely important.

It comprises of two parts.

1-Observing Animal Behaviour

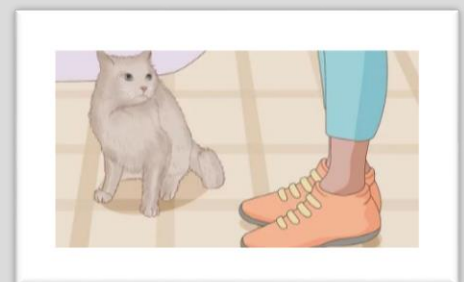
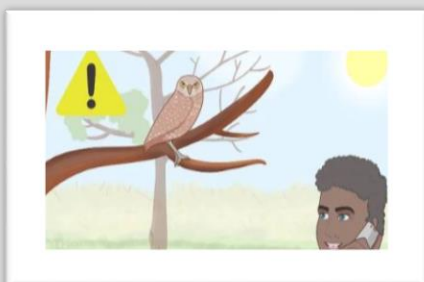
2-Observe For Physical Characteristics

1. Observing Animal Behaviour

Observe unusual or aggressive behaviour: Rabid animals may engage in non-typical behaviours. The most usual or common sign of rabies infection is overly aggressive behaviour. For example, a wild animal may lose its fear of humans and come towards them with aggressive behaviour. Normally tame animals might bark, or snap at people.

Observe signs of anxiety: Infected animals express or show anxious behaviour soon after clinical signs of infection appear.

A rabies-infected animal may express anxiety by licking or chewing on their initial point of infection.

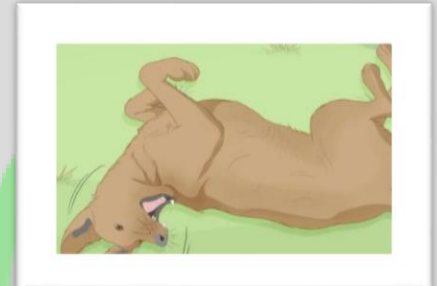
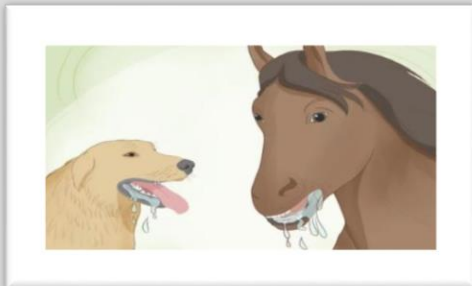


2-Observe For Physical Characteristics

Observe excessive salivation: A common sign of rabies is (hyper-salivation) increased production of saliva. Dribbling of saliva from the mouth and foaming of the mouth is physical sign of rabies.

Observe for signs of paralysis: Paralysis is (the inability of an animal to move or properly use its body parts) physical sign of rabid animal. Paralysis often manifests in the head or throat, arms, legs, or elsewhere in the body.

Other signs: Other classic signs include loss of appetite, weakness, change in voice, fever, hypersensitive (to touch, sound and light) and try to hide itself in dark places.



5. Pre-exposure prophylaxis/ vaccination

It means rabies vaccine given to anyone who is/are at greater risk of getting rabies, such as veterinarians and people who work in animal shelters. It is much necessary for People who work with rabies in laboratory settings, wildlife officers and If you are travelling to a country where rabies is widespread, you should get advice from your doctor about the possibility of receiving pre-exposure vaccination against rabies.

Consider pre-exposure prophylaxis/ vaccination if:

- Your planned activity will bring you into contact with wild or domestic animals, if you are a biologist, or veterinarian working with animals.
- You are deciding to visit remote areas where medical care is much difficult to obtain or may be delayed, and travelling through remote villages where dogs are common, chances of rabies are more.
- Your staying plan is longer than 1 month in an area where dog rabies is common.
- Although pre-exposure vaccination does not mean to eliminate the need for additional therapy after a rabies virus exposure but its means to simplify the management by eliminating the need for rabies immune globulin and decreasing the number of doses of vaccine needed.

Primary Vaccination

Three 1.0-mL injections of HDCV or PCEC vaccine should be administered intramuscularly (deltoid area) -- one injection per day on days 0, 7, and 21 or 28



6. Post-exposure prophylaxis (PEP)

Post-exposure prophylaxis (PEP) is the instant treatment of a bite victim after rabies virus exposure. This prevents virus entry into the central nervous system, which results the death.

PEP consists of:

Extensive washing of wound/ Biting site

This first-aid measure includes quick and thorough flushing/ washing of the wound for a minimum of 15 minutes with soap and water or detergent. Use iodine or other substances that remove and kill the rabies virus.

Treatment

The patient usually need to go at the health centre or hospital over the course of a month for at least three more vaccinations. Patient should thus receive at least 4 injections. It is very important to complete the whole course of vaccinations as recommended by the doctor, otherwise it becomes risky and fatal for patient.

Recommended post-exposure prophylaxis for rabies

Category of exposure to suspect rabid animal	Post-exposure measures
Category I – touching or feeding animals, licks on intact skin (i.e. no exposure)	None
Category II – nibbling of uncovered skin, minor scratches or abrasions without bleeding	Immediate vaccination and local treatment of the wound
Category III – single or multiple transdermal bites or scratches, licks on broken skin; contamination of mucous membrane with saliva from licks, exposures to bats.	Immediate vaccination and administration of rabies immunoglobulin; local treatment of the wound

7. How to avoid dog bites and prevent Rabies

How to avoid dog bites:

Insurance of the safety against dog bites for rabies prevention is only hidden in the pursuance of these principles.

- Do not try to run or scream in front of a dog, be still like trees in that case.
- Strictly avoid eye contact with a strange dog.
- Never try to pet wild or stray animals, the act of reporting to the wildlife department about it or any other related organization for any abnormal behaviour of stray dog without any delay is beneficial.
- A dog younger than 3.5 months of age is preferable over the old one to be a pet.
- Breed-specific behaviour should be considered before buying a new dog because of some very aggressive breeds of dogs like such breeds Pit Bull, Chihuahuas, Wolf Dog Hybrids and German shepherds etc.
- Do not try to humanize your new dog or treat it as a child/mate.
- Do not kiss or hug your newly purchased dog, It can lead to more confusion or aggressiveness for the animal.

- Do not allow children to play with dogs in the absence of adults, as they are considered at greater risk because they often receive more serious bites, or may not report bites.
- Don't disturb or tease dog who is eating, caring for puppies, or sleeping.
- It is necessary to consult with a veterinarian for the proper vaccination of your pets.
- Don't disturb or tease the dogs, when they are eating or near food.
- Don't approach the dog, as this can frighten it.
- Never surprise and tease a sleeping dog.
- Don't enter a strange dog's yard without the owner being present and don't let to know the dog of your presence.
- Don't try to touch any dog you don't know or that don't know you.
- Don't try to play with a dog with puppies, while the mother is still feeding them.
- Don't run or pass away from strange dogs, as this can make them more likely to attack.

How to prevent Rabies:

Non-Biting Case

- If the patient has only fed or touched an animal, they will not have needed rabies vaccinations.
- If the animal has licked a person's skin, but his skin is unbroken (there are no cuts or open wounds on it), he will not have needed anti-rabies vaccinations.
- If the patient has small scratches and rabid animal licked it, wounds will be treated and they will be given anti-rabies vaccination immediately.

Biting Case

➤ If animal is rabid and it bite to a person then do following steps

Step 1: Immediately wash the wound with soap under running water for 15 minutes minimum.

Step 2: After washing wound/ biting site, apply the disinfectant such as alcohol or iodine solution.

Step 3: Immediately consult with your doctor or Go to nearest Health centre.

Step 4: Anti-rabies vaccine should be administrated under advisory of your Doctor.



➤ **What we should do with animal after biting.**

- ✓ The animal should be separated from other animals (isolation or quarantined) and should be watched for signs of rabies for 10 days.
- ✓ If the dog dies within this period, it should be reported immediately to the local veterinary office so that the carcass tested for rabies.
- ✓ Inform the doctor or health staff about the death of the animal, so that they will guide further treatment of the bite victim.
- ✓ If the dog stays healthy for the entire 10 days that remained under observation then let the dog back to its normal life.

8. Challenges in Preventing Rabies

Unawareness of people: Unawareness and illiteracy is the major problem which leads to death in under developed and developing countries. People see an animal that can't drink and eat and go close to it without knowing that it's a deadly disease, so they should be aware of that disease.

Broad range of host: Most people think that rabies is particularly disease of dogs but it's not, it can infect a wide range of animals including humans, the Rabies virus has a wide range of host animals.i.e. Cats, Cows, Ferrets, Goats, Horses, Dogs, Bats, Beavers these include both pet and wild animals.

A poor country's disease: Rabies is a disease of poor people who live in extremely populated areas with no proper control of the stray animals. The expenditures of travel to health centre, and vaccines, may be too high for poorer families.

Vaccination challenges: Vaccines are costly in underdeveloped countries and making rabies difficult to control. Nerve tissue vaccine is unfortunately most frequently used in developing countries and it has autonomic side effects.

Traditional treatments: Instead of getting medical care, some people may prefer to seek traditional treatments, which could be detrimental to their health.

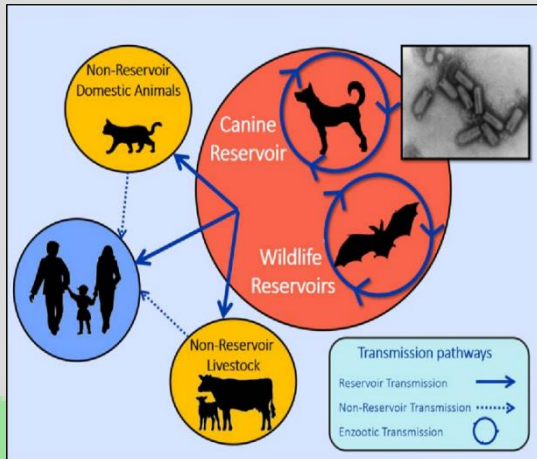
Diagnosis challenges: It is a most difficult task sometimes to diagnose rabies for a veterinarian. Clinical diagnosis is difficult in areas in which rabies is not endemic and not entirely depend upon nervous signs because nervous signs do not appear instantly after infection.

In-coordination between Public Health and veterinary sector: The public health and veterinary authorities may not be able to work together to control and preventing rabies. Rabies affects both humans and animals, so regular vaccination of dogs and cats can impart to human health as well.

9. One Health and Rabies

One Health Concept: One health concept (OHC) is a collaborative concept that links the health of humans, animals, plants & the environment shared by them. If anyone of these gets disturbed, the result will be the disturbance of other components of the chain as they are linked together.

Link of Rabies & One Health Concept: Not only rabies but all the zoonotic diseases have a connection with one health concept. As zoonotic diseases are transferred from animals to humans, unhealthy animals would also result in deterioration of human health



As evident in the above figure, rabies virus can transmit directly (from canine or wildlife reservoirs) or indirectly through non-reservoirs (domestic animals or livestock). So in case of rabies, there is illustration of one health concept. If our animals are not healthy, humans can never be healthy. That's exactly what One Health Concept elaborates.

How to maintain One Health view of Rabies:

As rabies is a zoonotic disease, which means it will disturb humans health, but the virus is transmitted from animals either reservoir or non-reservoir. So the aim should be to keep the animals healthy. In Pakistan, about 90% of the cases of rabies are associated with dog bites.

- Rabies vaccination of dogs which can be administered in one dose when dog has three months of age. Booster shots are also required annually.

10. Role of a Veterinarian in Preventing Rabies

In prevention of rabies, role of a Veterinarian is remarkable. With the help of Veterinarians' cooperation in prevention of rabies, the cases of rabies can be controlled significantly in a community. These are some points that a veterinarian should consider for prevention of Rabies.

Awareness: Veterinarian should aware the local people about the harmfulness and ultimate results of rabies. He/she should teach the people or advise them, how to cope out with rabies, what to do after dog bite and how everyone can protect oneself from rabies.

Prevention Campaigns: A veterinarian should require to create awareness material & try to promote awareness messages through his/her social connections. Coordinate with social organizations to help them and urge them for taking part in public awareness about vaccination's importance.

Vaccination: Most fundamental practice for control of rabies is vaccination

- As vaccination is the only effective way in prevention of rabies though it's a difficult task to vaccinate all the dogs but it is not impossible.
- Government should make such policies with the cooperation of veterinarians that can promote & supervise effective vaccination.
- And main important thing about vaccination is Pre exposure and Post exposure prophylaxis concept, veterinarian should clear these terms to people.
- If someone becomes victim of rabid dog then he/she must go to near public health centre for vaccination and if any animal is victim then owner should take it to the veterinarian.

Diagnosis and Research: High authorities associated with public health and surveillance must design research laboratories where proper diagnosis and evaluation of data can be done. In this regard, veterinarians can play their vital role.

Neutering Polices: Government should define policies for implementing vaccination & neutering of pets. There is need to involve public & private veterinarians for above both jobs to perform. Special incentives

should be given to veterinarians & pet's owners to promote these activities. Many NGOs are working for rabies elimination but result is not fruitful so it's the duty of our law & governing bodies to think about it and work on it.

11. Importance of Rabies awareness

Say No To Death From Rabies: If people are aware then nothing is more realistic than this fact that there is no reason for anyone to die from rabies in today with bite avoidance, mass dog vaccination, appropriate wound care and post-exposure treatment. We can save thousands of lives each year and keep remembering that there is no alternate to the life of a person.

Education is Vital to Prevent Rabies: Isaiah, a 12-year-old boy is bitten by dog in March 2018, in MALAWI. He goes for vaccination drive but unfortunately, hospital didn't have rabies vaccine and he with his dog tested positive for rabies. So, in urgency, with Government support, he was vaccinated and then after six months of exposure, he became first young ambassador for rabies and educate the people about rabies awareness and importance. Isaiah says about value of awareness: "you should know that Vaccination is very vital because it protects our dogs and other animals such as cats from rabies,"

Why Awareness is Mandatory?

Throughout ASIA and Africa, 40% of 59000 deaths occur because of rabies and there is one death in 9 minutes so rabies is becoming a danger and devastating burden on poor communities of our society. Along, the youth are the super power of any nation and mostly rabies death is occurring in youngsters with less than 15 years of age. So, awareness is necessary to build a healthy community.

Importance of Awareness:

- After the appearance of clinical signs, there is no treatment of rabies so awareness among the people is best way to control as if the people are aware enough then they will teach their children to behave safe with pets and then vaccinated owner and vaccinated pet will take rabies level up to zero.
- Educated community will know about proper vaccination schedule, control strategies and will aware others about proper concept of zoonosis. They will know that avoiding contact with all types of wild animals whether injured or diseased is important to stay safe. The guided society will report about all stray or dead animals without being in contact with them.
- When communities understand the importance of keeping their dogs and all other pets healthy, they are more than eager to bring their dogs to get vaccinated and when health workers are trained, they can save the lives of people who are exposed to rabies.
- By strengthening and expanding these campaigns, we can continue to move towards a goal of global dog-mediated rabies elimination and then at the end, mission with slogan Zero Human Deaths by 2030 will be achieved.

Awareness Encourages the Community:

- ✓ By awareness and knowledge, People are encouraged to seek medical help after an encounter with a wild animal or rabid animal, even if they do not have bite marks or other outward signs of injury.
- ✓ They will know how to treat, confine and restrict the pets in houses rather to free them outdoors.

So, at the end, only remaining thing is hope that soon, it will be announced that "awareness makes the people mature enough that they keep pets, love them, but with proper education and vaccination, with aim to protect their own health too".

12. Methods of rabies awareness for farmers

Without awareness, it is too difficult to eliminate the disease from our community. So in order to make our community rabies free, following awareness methods should be adopted.

1) Rabies informational sessions for farmers

This is the best way of rabies awareness campaign for farmers especially illiterate ones. When sessions are conducted, there is face to face communication between the farmers and rabies awareness team. So we can expect a good response by this method.

Time selection of session is very much important to target maximum community. Session should be conducted when maximum farmers are free from their work.

2) Text messages

This is another way of rabies awareness but it is effective for educated farmers. It is a time saving method because in minutes or even seconds we can target thousands of farmers. But it is not as effective as awareness session because there is lesser response in text messages as compared to informational sessions in which farmers feel free to ask any question on the spot and there is no confusion left.

3) Posters and leaflets for rabies awareness

We can also play our role of rabies awareness by publishing posters and leaflets. When publishing posters keep in mind that posters and leaflets should contain maximum images.

Benefit of publishing images is that those farmers who are not educated can also understand by graphical illustrations of the image.

4) Rabies awareness in veterinary hospitals

This is also a best way of rabies awareness because by adopting this method we have not to go for specific spot and also there is no time management issue. Rather the farmers who came to hospital to treat their animals are focused and the doctor or para veterinary staff can tell them about rabies prevention and control.

13. Role of a Veterinarian in Rabies Awareness

- Dog bite is a common and potential source of disease spreading in most countries thus veterinarians can play their role in providing awareness to people about handling of a rabid dog, dog bite prevention and first aid treatment regarding dog bite.
- Most of the people are fond of keeping dogs as their pets so, they must be aware of Rabies transmission and its prevention. Veterinarian must engage them to vaccinate themselves as well as their pets against rabies as soon as possible when they buy them.
- Veterinarians can run a rabies awareness campaign by telling public about a wide range of hosts (mainly dogs, bats, foxes, jackals and domestic animals) so people can protect themselves from suspected cases because there is no treatment available for rabies except prevention.
- In areas where domestic and wild animals normally live together, veterinarians should have regular visits and engage owners about vaccination of their animals by explaining them how deadly disease the rabies is.
- Veterinarian should also guide pet owners to place wild and domestic animals separately because wild animals especially dogs are more prone to get infection.
- Veterinarian should aware people regarding incubation period, signs and symptoms and handling of a rabid case.
- They should tell them if a person accidentally exposed to a dog bite, the person should observe the dog for at least 10 days and if he found some peculiar behaviour in dog regarding rabies he must go for his doctor advisory.
- In countries like Pakistan stray dogs are potential source of disease spreading. In this regard, veterinarians can help nation by providing awareness about controlling stray dog population (by neutering, killing or vaccination)
- So veterinarians arrange seminars regarding rabies prevention and control in various schools and colleges to guide children as well as young ones about rabies.

14. Current Status of Rabies Disease in Pakistan

Rabies is neglected disease in Pakistan although the incident of dog bites in Pakistan is very high. In **2010** more than **97,000** of recorded cases of bites were reported by basic health units. Those managed by secondary and tertiary care facilities, private practitioner and spiritual healer. **Rabies** known as older and fatal disease to mankind has been taking away precious lives since **4000** years.

Weak Points of Pakistan Regarding control of Rabies:

- ✓ Lack of surveillance system
- ✓ Inadequate response and political support.
- ✓ Limited access to up-to-date rabies vaccine and immunoglobulin.
- ✓ Weak collaboration between different Government and health and veterinary Science authorities.

Response of WHO Regarding Rabies in Pakistan:

WHO in cooperation with provincial health authorities is working to develop dog bite treatment centre to make strong post exposure prophylaxis (Treatment). Plans are being formulated to also involve other sectors e.g. livestock authorities and veterinary research centre in Rabies prevention and control.

Main features are:

- Mass awareness on rabies transmission and prevention using cost effective methods like community communication structure and local government.
- Make sure the availability of most cost effective and efficacious anti-rabies vaccine in designated rabies treatment centre in all districts
- Development of proper channel to decrease stray dog population in district through use of modern bait vaccination and elimination method.
- Establishment of rabies treatment centre in each district headquarters hospital where health care provider will be trained on treatment and management of dog bites with anti-rabies vaccine.
- Development of proper Surveillance system to monitor dog bites, rabies in dogs and human through use of existing death reporting system under local government structure.
- Research on animal rabies and development of animal and human rabies vaccine by university of Veterinary and Animal Science Lahore.

15. Current Scenario of Rabies in the World

As we know that the disease Rabies is not new. Its record has been found since 2300 BC during the Babylonian times where the person, whose dog had transmitted rabies to another human being was charged with fine.

Dogs are the major source of rabies transmission in developing countries while bats are commonly associated with rabies in developed countries. The reason for this is that in developed countries, the campaign of dog vaccination arose and mostly all of the dogs (including strays) have been vaccinated.

In developed countries:

Following countries are generally recognized as rabies-free countries:

American Samoa, Antigua, Aruba, Australia, Barbados, Belgium, Bermuda, England, Fiji, French Polynesia (Tahiti), Guam, Hawaii, Ireland, Jamaica, Japan, Malta, New Caledonia, New Zealand, Northern Ireland, Saint Lucia, Scotland, Singapore, Sweden etc

- ✓ This is because of their wide-spread vaccination and awareness campaign. This has also been achieved due to the availability of vaccine in their health care facilities.

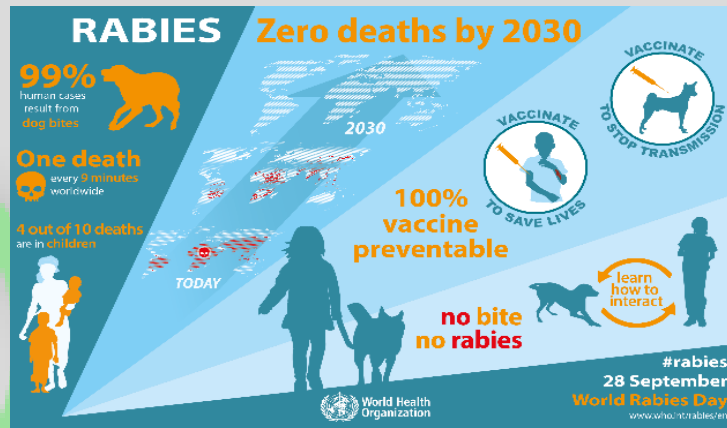
In developing countries:

The under developed countries which are not rabies free included Asia and Africa. These countries have the large number of rabies cases per annum due to lack of healthcare facilities in rural areas and the absence of vaccine. The lack of awareness has also led the people into this disaster.

Organizations:

Global alliance for rabies control GARC is playing an important role in the elimination of the rabies from the world. It has been educating people and providing guidance and assistance to organizations working for the awareness and vaccination in under-developed countries. Its motto is to end rabies by the end of 2030 by vaccination as there is no treatment available right now.

- ◆ Other organizations like FAO and WHO are also taking part here and these are working to eliminate this fatal disease



16. Importance of Rabies Day

- On September 28, 2007, the first World Rabies Day was commemorated. From 2007 rabies day is observed every year on the same date with a specific theme. World rabies day aims to raise awareness about rabies and suggest the proper ways for prevention and control of rabies worldwide.
- World Rabies Day gives us an opportunity to reflect on worldwide efforts to control the deadliest disease. World Rabies Day provide a chance to raise awareness related to rabies, and provide information on disease prevention in at-risk communities.
- Public health organizations arrange events to promote rabies awareness around the world especially on September 28.
- Each year world rabies day is coordinated by The Global Alliance for Rabies Control(GARC). In the past decade around 17000 registered events have been held worldwide through the global rabies community.
- International agencies and governments recognize the importance of Rabies eradication and control programs and thus support World Rabies Day. In this changed scenario of rabies, 28th September can be seen as a day of general importance but it has also become an integral part of the strategy for rabies elimination at every level (national, international, or regional)

17. Who is/are at risk in case of rabies?

Animals at risk:

- If we talk about rabies in animals then every animal is at risk of rabies, its mean any is susceptible to rabies virus despite of specie. But the most common reservoir of rabies virus are Raccoons, Skunks, Bats, Foxes, and Mongoose.
- All domestic animals are at more risk of rabies such as Cattle, Cats, Dogs, Horses, Donkeys, Sheep and Goat.

Rural population:

- Those areas that have increased population of stray dogs also have highest cases of dog bites and we know the major mean of viral transmission is by dog bite.

Animal control officers:

- Those individuals who work in organizations of animal control are also at risk of getting rabies like those who are responsible for the control of population of stray dogs and cats, controlling wild animal population like of jackals, wild boars, foxes etc.

Lab workers:

- Lab workers who performs different experiments or do research or study on rabies are also at risk of rabies as they are in very close contact to virus

Veterinarian:

- As in early cases of rabies in animals there are no mark differential signs of rabies infection so, the vets properly examine the animal and in doing examination they become in contact with the infected saliva openly that's why they are at greatest risk

Butchers:

- Butchers are also at risk of getting rabies infection either because of lack of knowledge or due to slaughtering of infected animals. Even the consumption of meat of infected animal can also cause rabies.

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