

## ZOONOSES

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Diseases spread by animals - generally classified under the broad heading "Zoonoses". Zoonoses have been defined as those diseases which are transmitted to man from vertebrate animals.

Zoonoses are generally considered as an occupational hazard faced by agricultural, industrial and laboratory workers and animal handlers. eg: bovine tuberculosis in farmers, salmonellosis in food processors.

Major Zoonoses include

1. Tuberculosis
2. Brucellosis
3. Leptospirosis
4. Salmonellosis
5. Typhus Fever or Tick Fever
6. Plague
7. Rabies
8. Fungus infections - *M.canis*  
*M.equinum*  
*M.gallineum*
9. Arbovirus infections - eg. Japanese encephalitis

### Tuberculosis

This disease is caused by a bacterium known as *Mycobacterium tuberculosis*. This bacterium exists in two forms, the human form and the bovine form. The bovine form is responsible for disease in cattle.

This disease is transmitted from cattle to humans mainly through consumption of milk from infected cows. This bacillus is secreted in the milk.

### Prevention

1. Pasteurization kills the tubercle bacillus. Therefore if milk is either pasteurized, or boiled or sterilized, this bacterium is killed. Transmission to humans is

avoided by following these procedures. Raw untreated milk should never be consumed.

2. Spread to humans can also be controlled by routine testing of cattle and isolating the animals which give a positive tuberculin reaction, and ensuring that only tuberculin negative animals are used for milking purposes.

### Brucellosis

This disease is caused by bacteria belonging to the genus *Brucella*. There are three strains of *Brucella*. *B.abortus*, *B.mellitensis*, and *B.suis*. *B.abortus* causes disease in cattle, *B.mellitensis* in goats, and *B.suis* causes infection in pigs.

Man get infected accidentally by consumption of infected milk or milk products such as butter and cheese or by handling infected animals. Infected animals excrete these bacteria in their discharges such as urine or milk or vaginal secretions. Thus it is mainly an occupational disease in farming communities, veterinarians, and in butchers. The bacterium can get into the body through minute abrasions in the skin, through the alimentary and respiratory tracts and sometimes through the conjunctiva of these workers.

Prevention of human infections can be achieved by pasteurization of milk and ensuring that other products such as cheese and butter are made from pasteurized milk.

This disease is characterized by intermittent fever accompanied with gland swellings. It is also one of the causes of pyrexia of unknown origin. Can be diagnosed in the laboratory by a test for antibodies produced in the infected humans.

Human infection by *B.suis* is almost entirely an occupational infection arising through contact with infected pigs or pig meat.

## **Leptospirosis**

This is caused by a fairly large spiral bacterium known as *Leptospira*. The disease can occur in a number of animal species such as cattle, pigs, goats, horses and rodents. This is a disease transmitted most often by infected rodents. Epidemics occur in Sri Lanka from time to time. This disease is endemic in certain parts of Sri Lanka. Leptospirosis is normally spread through contaminated water. The bacterium responsible is shed to the outside through the urine of the animal having this organism. The leptospira survive in the contaminated water and get into the human body through minute cuts and abrasions in the skin and through the mucus membrane of the mouth, lips, and nose and through the conjunctiva. Thus the disease can be contacted by working in infected water or by washing in infected water. Generally affects persons who work in marshy lands, like farmers, fisherman and fish handlers who work in contaminated water, or in abattoir workers when they handle infected animals.

### Symptoms

Fever, body pain, conjunctival infection, usually accompanied by jaundice are the symptoms of the disease. It is locally known as "Kahauna" and is well known and recognized in certain areas in Sri Lanka. Jaundice may not always be present.

### Laboratory diagnosis

The disease can be diagnosed conclusively by testing the blood for antibodies using a test known as Leptospira Agglutination Lysis test. In the acute stage, the organism can also be cultured from the blood, urine or CSF of the patients. This is done by injecting the samples of blood etc. into hamsters or guinea pigs and isolating the organism from these animals.

## **Typhus fever or Tick fever**

Transmitted to humans through the bite of a tick that lives in rodents. This is caused by a small organism called *Rickettsia*.

These are neither bacteria nor viruses. This is primarily an infection of rodents and man is accidentally infected.

## Diagnosis

It is diagnosed in the laboratory by detection of antibodies in the blood of infected persons. The test is known as the Weil Felix test and the disease is known as Weils disease.

## **Salmonellosis**

Another disease that spreads from a variety of animals is salmonellosis which is generally contracted by eating food or food products made from infected animals. It is transmitted mainly through eggs, milk, meat and meat products.

### Symptoms

Eating contaminated food causes abdominal pain, diarrhoea and vomiting accompanied by fever and headache. Symptoms appear a few hours after eating contaminated food.

### Prevention

The disease can be prevented by eating food that is thoroughly cooked and avoiding eating uncooked or inadequately cooked food. It is also important to bear in mind that food can be contaminated after cooking (even if the cooking has been carried out properly). This can happen if the kitchen hygiene is not maintained. i.e. if utensils such as knives used in cleaning of infected food is used to process cooked food.

Control and prevention of infection in animals is also an important factor in prevention.

## **Rabies**

Rabies is a very dangerous and fatal zoonosis which spreads from infected animals. Spread to man especially from infected dogs. But infections can also occur from the bite of infected rats bandicoots, and other domestic or wild animals.

This disease is fatal and is caused by a virus called rabies virus. It is introduced into man by the bite of an infected animal. The virus travels along the nerves to the brain and causes an inflammation of the brain. Patient in variably dies of the disease which is called hydrophobia.

This name is given to the disease because infected patients are unable to drink water due to a spasm of the throat muscles.

#### Prevention

1. By preventing infection among animals through vaccinations of the domestic dog population.
2. Advise regarding the management of any person bitten by an animal suspected of being rabid should be obtained immediately.
3. As a first aid measure the wound should be cleaned with soap and water immediately after a bite.

#### **Anthrax**

This is mainly a disease of cattle and is spread to man accidentally. Human infections are rare and are generally found in farm workers handling infected animals.

The anthrax bacillus can thrive for long periods in animal products such as hides, hair and wool. The main source of infection to humans are infected carcasses, wool, hair and hides.

#### **Plague**

Caused by a bacterium known as *Pasteurella pestis*. This disease is not very common today. In the past plague has been responsible for many epidemics and has accounted for thousands of deaths. It is a disease of rodents where the bacterium is transmitted to man through a flea. It has

now been controlled to a great extent and no epidemics have occurred in the recent past.

#### **Fungal Infections**

Certain types of ringworm infections are found in dogs, cats, cattle and fowl. These are transmitted to humans through direct contact. Cattle, fowl, and horse ringworm are generally common among farm workers. In the case of ringworm from dogs and cats, these are generally found among children who come into contact with infected pets. Each of these animals are infected by a different species and therefore it is possible to find out the source of infection by studying the infecting species in humans. For example *M.canis* caused infection in cats and dogs, *M.equinum* caused infection in horses, and *M.gallinae* caused infection in fowl.

#### **Arbovirus Infections**

The most important arbovirus infection transmitted to man from animals is Japanese encephalitis. This is transmitted from infected pigs to man by the bite of a mosquito. This disease is especially prevalent in pig breeding areas. Prevention is achieved by preventive vaccination of pigs in endemic areas, and by vaccination of the susceptible population.

Zoonoses therefore present a major health hazard and the community at large should be aware of and be informed of the modes of spread and control. With proper precautionary measures, the majority of these diseases can be prevented.