

Popular Article

Brucellosis: A Great Threat to Human Health

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Introduction

Brucellosis is one of the major zoonotic diseases worldwide with more than 500,000 human cases occurring globally every year. It is one of the great hurdles for the development of animal production when we talk about dairy farming or rearing a breeder stock of animals in general. The knowledge and awareness of this disease, specifically regarding its zoonotic nature, mode of transmission, and signs in humans and in animals is critical when we talk about human health. Raising awareness amongst livestock owners, dairy farmers, abattoir workers, breeders, veterinarians, para-veterinarians, pregnant women and children is very important for its prevention and control.

Etiology and Transmission

The disease is caused by a family of bacteria Brucellaceae and genus *Brucella*. It is very commonly called Mediterranean fever, Gastric fever, Bruce septicaemia, Malta fever, undulant fever especially in humans and Bang's disease, and Contagious abortions in animals. The disease is caused by *Brucella abortus*, *B. melitensis*, *B. suis*, *B. canis* and *B. ovis* mainly in Cattle, Sheep goats, pigs, dogs

and sheep respectively. But few species of bacteria can infect multiple hosts. Humans can get infected mainly by *B. melitensis*, *B. abortus*, *B. suis* and *B. canis*. Humans can get infection by ingestion, inhalation and contact with body fluids.

- Eating undercooked meat of any such infected animal
- Consumption of unpasteurized (raw) milk or other dairy products made from contaminated milk
- Through coitus (rare)
- Contact with body fluids of abortion, dystocia, eyes, nose and mouth
- Persons working at hide industry
- Slaughterhouse workers
- Laboratory workers handling such samples
- Veterinarians and other staff members
- Animal breeders
- Farmers rearing livestock are at increased risk of exposure to such bacteria

Pathogenesis

The incubation period of the disease is variable depending upon the dose of infection, immunity status of the individual, and age of the animal and it mostly ranges in between 33 to 230 days. Once bacteria enter the body, it is localized in the regional lymph nodes from where it go to the intestinal epithelial cells (ingestion route),

then it gain access to lymphatics and the bloodstream leading to bacteremia giving symptoms of fever etc. Bacteria then settles itself in various body organs mainly, reproductive organs, lymph nodes, spleen, joints, liver and proliferates. In pregnant animals, bacteria have a special affinity for erythritol sugar which is present in chorio-allantoic trophoblast tissue of the placenta causing necrosis of the placenta leading to abortions. It is intracellular bacteria and grows inside phagosomes of macrophages, that is why it escapes antibodies initially and a few animals may remain persistently infected.

Signs and symptoms in humans

- Fever/ undulating fever in a few individuals
- Sweating
- Headaches
- Joint pains (hips, knees and lower back)
- Weight loss
- Abdominal pain and stomach upset
- Swollen lymph nodes
- State of depression
- Unexplained fatigue
- Pregnant females may abort in the last trimester
- Swelling of testicles and scrotal sac
- Infection in the heart - endocarditis
- Hepatomegaly and splenomegaly

Prevention and Control

When we talk about prevention and control of such zoonotic diseases it is very important to identify early signs and symptoms of this disease in animals.

- Animal owners or dairy farmers, Veterinarians and paravets must always wear protective clothing such as latex

gloves, goggles, gowns and masks while handling any cases of abortions in the last trimester in particular or retained placenta cases.

- Laboratory workers should also wear PPE and if exposed to infection one should follow recommendations for symptom monitoring and possible post-exposure prophylaxis or treatment.
- More and more awareness regarding no consumption of undercooked meat or unpasteurized milk, raw milk or buttermilk should be there among farmers.
- Regular screening of cattle herds and dairy herds by doing Rose Bengal precipitation tests and Milk ring tests should be there to know the status of Brucellosis in farm
- Vaccination of female cattle in enzootic areas with high prevalence rates of Brucellosis, after proper consultation from a Veterinarian.
- Timely serological tests in individuals exposed to *Brucella* infection along with consultation with a doctor for a course of antibiotics and duration of the course is a must.

Conclusion

Brucellosis is a serious public health concern and yet a neglected disease. With more urbanization, expansion of animal industries, lack of hygienic measures in animal husbandry and in food handling, lack of awareness amongst farmers brucellosis still remains a public health hazard and a threat to human health.