

# TYZZER'S DISEASE

## Agent

*Clostridium piliforme* is an obligate intracellular, spore-forming bacterium. In its vegetative form (within the host) it is a gram negative, motile rod. Infectious spores are shed into the environment, where they can remain at room temperature for at least a year. Spores can be inactivated with heat, sodium hypochlorite, or peracetic acid.

## Transmission

Spores are shed in the feces. An animal becomes infected by ingesting the spores, usually through contaminated food or bedding.

## Hosts

Many species are susceptible to *C. piliforme*, although there is some evidence that it behaves in a species specific manner, making cross-species infection less likely. Susceptible species include mice, rats, gerbils, hamsters, guinea pigs, rabbits, cats, dogs, non-human primates, and horses.

## Pathology

The first phase of infection is the colonization of the intestines (ileum and cecum). The bacteria then ascends to the liver, via the portal vein. Finally, bacteremia allows spread to other tissues and organs, most notably the heart. Intestinal lesions include thickened, edematous, hyperemic walls, blunted villi, ulceration, and hyperplasia of crypt cells. Rats may also have an atonic, markedly dilated ileum. The liver has multiple pale foci of necrosis. The myocardium may have multiple pale foci of necrosis.

## Clinical Effects

Infection is most commonly subclinical. However, clinical disease can occur with transportation stress, overcrowding, food deprivation, poor sanitation, or altered immune status. B-cell deficient animals are especially susceptible to disease. Clinical signs are mostly seen in nursing or weaning animals, but all ages may be affected. Signs include ruffled fur, inactivity, watery diarrhea, pasting of feces on the perineum, abdominal distension, and death. Morbidity and mortality levels vary.

## Diagnosis

Methods of diagnosis include assessment of clinical signs, serology, lesions seen on necropsy, silver stain of histological slides, and polymerase chain reaction (PCR) of tissues.

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## Control

There is no treatment that reliably eliminates the bacterium from a colony of animals. Elimination requires C-section rederivation or embryo transfer.

## Interference with Research

*C. piliforme* has been noted to cause some physiological effects

1. It can cause mortality in breeding colonies
2. Administration of cortisone/adrenocorticotrophic hormones can provoke clinical disease
3. Whole body irradiation can provoke clinical disease
4. Transplantation of ascites tumors can lead to disease
5. It alters the pharmacokinetics of warfarin and trimethoprim.
6. It alters the activity of liver enzymes (transaminases)
7. High protein diets have exacerbated the disease in mice.
8. Experimental disease in weanlings has been exacerbated by carbon tetrachloride treatment.

## References

- Infectious Diseases of Mice and Rats. National Research Council. National Academy Press. Washington D.C. 1991.
- Pathology of Laboratory Rodents and Rabbits. Dean H Percy and Stephen W Barthold. Iowa State University Press. Ames. 1993.