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accelerating drug development. exactly.

Streptobacillus moniliformis
(Haverhill fever, rat bite fever)

Classification
Gram negative, pleomorphic or filamentous rod

Family
Fusobacterium

Affected species
Mice develop clinical disease; rats are asymptomatic nasopharyngeal carriers of this organism. Gerbils and guinea pigs have been infected as well. This is a zoonotic infection, and the two synonyms listed above are names of the disease in humans.

Frequency
Common in wild and pet rats, rare in laboratory rats, laboratory mice, and wild mice.

Transmission
S. moniliformis is usually transmitted through rat saliva, via a bite. It may also be transmitted through ocular or nasal secretions.

Clinical Signs and Lesions
Generally none in carrier rats; rarely, opportunistic pulmonary infections or abscesses are seen.

In mice, susceptibility varies by strain, with C57BL/6 and outbred Swiss mice very susceptible, DBA/2 mice intermediate in susceptibility, and BALB/c and C3H/He mice resistant. Affected mice may present with sudden death due to septicemia, or a more prolonged septicemic course. Typical clinical signs include cervical lymphadenitis, diarrhea, conjunctivitis, cyanosis, haemoglobinuria, and weight loss. If animals survive the acute stages of disease, suppurative polyarthritis, osteomyelitis, and abscesses may be seen. On necropsy, the liver and spleen may contain widespread foci of necrosis and inflammation. Petechiae and ecchymoses may be seen on serosal surfaces. Renal involvement is secondary to septicemia, and usually consists of interstitial nephritis with bacterial colonies often noted.

Humans have a variety of clinical presentations, including fever, rash, polyarthritis, and endocarditis. *S. moniliformis* infection in humans may be fatal. Wild or pet rat bites should be reported to a physician and treated immediately.

Diagnosis
S. moniliformis may be cultured on blood agar from the nasopharynx of carrier rats or infected mice. Serology and PCR are also available.

Interference with Research
Although otherwise healthy, carrier rats are not suitable for use in research, due to the zoonotic potential of this organism. Affected mice are generally clinically ill and unfit for research purposes.

Prevention and Treatment
Since *S. moniliformis* infection is transmitted through direct contact with infected animals, their exclusion from the animal facility is a key point. Wild, feral, and pet rats should all be excluded from laboratory rodent areas. Incoming animals from non-commercial sources should be quarantined and tested for the presence of this organism. Staff working with laboratory rodents should not keep pet rats or work with wild or feral rats.

Although vertical transmission has been reported in mice (accompanied by fetal demise), hysterectomy or embryo transfer appears to be effective for elimination of *S. moniliformis* from carrier animals. The organism does not form spores, and is thought to have no significant environmental persistence, so normal environmental decontamination procedures should serve to remove *S. moniliformis* from the environment.

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