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Guinea Pig Cytomegalovirus
(GpCMV)

Classification

DNA virus, enveloped

Family

Herpesviridae

Affected species

Guinea pigs

Frequency

Common in guinea pigs, both pet and laboratory. Prevalence in wild or domesticated South American populations is unknown, but these populations are unlikely to have an effect on laboratory populations.

Transmission

GpCMV may be transmitted vertically or through contact with the saliva or urine of an infected animal.

Clinical Signs and Lesions

Clinical signs of GpCMV infection are extremely rare in immunocompetent guinea pigs. If clinical signs occur, they are nonspecific, including weight loss, ruffled hair coat, or mild lymphadenopathy. If the infection is contracted by a naïve female during pregnancy, especially late pregnancy, outcomes for the fetus are poor, and may include death *in utero*, runting, congenital neurologic abnormalities, or deafness. Experimental infection of young (<48 hours of age) animals may induce illness and retarded growth, evident by decreased body weight when compared to controls. Animals infected at one week of age or after have no clinical signs. Maternal antibody in guinea pigs is transmitted transplacentally but not in the milk, and fetuses born to mothers with longstanding GpCMV infections show no ill effects, although they may be infected with the virus. GpCMV does not induce tolerance, so the presence or absence of antibodies to the virus is a true indicator of disease status.

Common histopathologic changes noted are minimal and include karyomegaly and intranuclear eosinophilic inclusion bodies in the ductal epithelium of the salivary glands and renal tubules. Intracytoplasmic inclusions are rare. In disseminated disease, an interstitial pneumonia with necrotic areas in the liver, lymph nodes, spleen, and kidney may occur in addition to the lesions described above.

Diagnosis

Diagnosis may be through serology (ELISA, MFIA®, or IFA) or PCR. Characteristic lesions in the salivary glands or kidneys are also diagnostic.

Interference with Research

Since infection with GpCMV is used as a model of congenital and neonatal human cytomegalovirus infection, animals infected with this virus are unsuitable for this purpose. Otherwise, the minimal lesions associated with GpCMV are incidental findings. Based on human CMV infection, immunosuppression may result in activation and shedding of the virus, including the possibility of disseminated disease, although this has not been reported in guinea pigs.

Prevention and Treatment

Cytomegaloviruses persist in the host. There is no effective treatment for GpCMV, although evaluation of potential human treatments in guinea pigs are discussed in the literature. Autoclaving, formalin treatment, and disinfectants effective against herpesviruses will all inactivate GpCMV, as will desiccation or detergents.

In general, depopulation and restocking with GpCMV-free animals is unnecessary, but may be recommended for guinea pigs destined exclusively for cytomegalovirus or auditory research. Vertical transmission is possible, so embryo transfer rederivation allows for a better chance of success than hysterectomy rederivation. Embryo harvest and transfer in guinea pigs is technically challenging. Prevention consists of preventing close contact of infected animals with GpCMV-free populations.

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