Evaluation of Ocular Exposure to *Leptospira borgpetersenii* Serovar Hardjo in the Golden Syrian Hamster

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A recent report described a chronic and an acute model of infection in hamsters. The study employed two different strains of *Leptospira borgpetersenii* serovar Hardjo (203 and JB197).[1] These models were developed using the intraperitoneal route of inoculation; however, infection by *Leptospira* is believed to occur by exposure of mucous membranes or compromised skin to infected urine, contaminated soil, or contaminated water. In order to evaluate the effects of a natural route of exposure, a pilot study was conducted infecting hamsters with 203 and JB197 by the ocular route. Hamsters were sedated, and media was deposited onto the surface of each eye, representing a total inoculum of $5x10^7$ organisms. Tissues were obtained for culture, indirect fluorescent antibody testing (FAT), and silver stain on Days 6, 13, 20, and 27 post-inoculation (PI) or upon demonstration of clinical signs. Only one of eight hamsters inoculated with JB197 developed clinical signs, at Day 12 PI. All other animals inoculated with JB197 did not develop any signs of disease; and tissues were negative by culture, FAT, and silver stain at each of the timepoints evaluated. While none of the animals inoculated with 203 developed outward signs of disease, liver sampled on Day 6 PI and kidney sampled on Days 13 and 20 PI were positive by culture and FAT. Pooled kidney tissue was culture- and FAT-positive at Day 27 PI. It was an unexpected observation that the strain causing acute disease (JB197) was poor at establishing lethal infection when applied by a more natural route of inoculation, whereas strain 203, which develops chronic disease in hamsters, was able to establish long-term infection. These results further demonstrate stark differences in infection patterns of two leptospiral strains with a high degree of genetic similarity. Further study is needed to build upon these observations and the use of hamsters as a bovine leptospirosis model.

[1] Development of chronic and acute golden Syrian hamster infection models with Leptospira borgpetersenii serovar Hardjo. Zuerner RL, Alt DP, Palmer MV. Vet Pathol. 2012 Mar;49(2):403-11

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All animal use was carried out in accordance with all applicable animal care and use laws, regulations, and guidelines and the Institutional Animal Care and Use Committee approved these studies.