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More Evidence of Interspecies Transmission of *Mycobacterium avium* subsp. *paratuberculosis* Between Livestock and Wildlife: The Hare

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Objectives

The aim of this study was to evaluate the potential association between the prevalence of *Map* infection in cattle and the prevalence of *Map* infection in hares, in southern Chile.

Material and Methods

• A case-control study was performed in southern Chile. A highly infected dairy herd (A) with historical information about disease status (10 cases/year with clinical cases and infection confirmed by fecal culture) was used as case. A second herd (B) without history of clinical disease, serologically negative at least at two consecutive testing one year apart and located more than 300 km apart from the case herd, was used as control herd.

•50 hares from herd (A) and 42 from herd (B) were captured and processed for *Map* detection from ileum (IL), mesenteric lymph nodes (MLN) and fecal samples (FS).

•Hares were hunted in 2 rounds in each herd by professional hunters, during June and July 2009 and the location of hares at the moment of capture was geo-referenced.

•Cattle pooled fecal samples from 5 animals were obtained from a representative group of the older lactating cows (150).

•Soon after hunting, hares were quickly transported to the necropsy unit at the Faculty of Veterinary Sciences, where representative tissue samples were aseptically collected. Samples were decontaminated and processed following manufacturer's protocols for cultivation in an automated liquid culture system (BACTEC MGIT 960). After incubation at 37 C for 49 days, DNA was extracted from all positively signaling tubes, and real-time PCR based on the IS*900* and MAP02 genes was performed, to confirm MAP. Age of hares was estimated based on dried weight of optical lens.

The association between characteristics of hares (sex, age), location (Farm A vs. B) and round of capture (first, second) and disease status, were assessed by logistic regression (LR) adjusted by the estimations of diagnostic performance.

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Conclusions

We found evidence for interspecies transmission, but the proved association is not necessarily causal.

Absence of histopathological lesions might indicate absence of disease.

The results improve the epidemiological knowledge on paratuberculosis regarding interspecies transmission and the concept of livestock as a source of infection for wildlife.

Results

• In herd A, 45 individuals had one or more type of sample signaling culture positive, whereas in herd B, 17 hares showed at least one positive culture result ($P < 0.05$).

• Regarding pooled samples of bovine feces, herd A showed 20 positive samples out of 30, compared to 12 out of 30 for cows from herd B. Cattle herd and hare prevalences of infection were statistically significant ($P<0.05$).

• MAP infection was detected in MLN of hares one to four months old. Tissue samples positive for MAP in hares with FS positive culture varied as age increases, however, oldest categories (8-12 months and >12 months) seems to present more proportion of infected tissues.

• Also, more hares captured from herd A were infected and in these hares at least one tissue was MAP+, in comparison with those from herd B. In addition, infected individuals from all ages categories were detected in herd A, whereas only old animals in herd B.

• After checking for interactions and potential confounders the final LR model contained 3 variables, however, only the variable "farm where hare was cropped' was statistically significant.