

eP081

ePoster Viewing

Lyme borreliosis

REDUCTION IN THE NUMBER OF PATIENTS WITH NEUROBORRELIOSIS, FOLLOWING A SIGNIFICANT REDUCTION IN ROE DEER ABUNDANCE ON THE ISLAND OF FUNEN, DENMARK

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Objectives

The Roe deer (*Capreolus capreolus*) population on the island of Funen, Denmark has since the year 2002, been suffering from increased mortality. The underlying cause has so far been connected to symptoms of diarrhea and malnutrition of unknown etiology and there has been a 50% reduction in the annual hunting bag, mirroring the existing abundance of roe deer.

It is well established that the abundance of the tick *Ixodes ricinus*, - the vector of *Borrelia burgdorferi* s.l. in Europe,- is correlated with the abundance of roe deer. Since tick abundance correlates with human cases of neuroborreliosis, it can be expected that changes in roe deer densities lead to changes in human neuroborreliosis cases in the region.

Due to the sizable reduction in roe deer abundance on the island of Funen, it was hypothesized that the number of *I. ricinus* must have declined and thereby the number of patients with neuroborreliosis. However, since the ticks has a three year lifecycle and human mainly serves as hosts for nymphs, it was suspected that the reduction of neuroborreliosis cases were delayed as compared to the reduction in roe deer, which serves as the main host for adult ticks.

Methods

Patients resident on Funen and hospitalized with intratecal antibody response to *Borrelia Burgdroferi* s.l. (A) and/or the diagnosis ICD-10A69.2 Lymes Disease (B), were compared to data from the annual Danish Game Bag Statistic on roe deer(C). Data were analyzed by linear regression modeling using SAS 9,3.

Results

The data collected from 1990/94 to 2013 is shown in figure 1*. Linear regression show significant correlation with the roe deer bag for current year, and bag numbers of the past one to three years (P's <0.0001). The degree of explanation vary considerably from R-square = 0.42 for current year roe deer bag, to R-square = 0.51, 0.62 and 0.49 for the past one to three years, respectively. The highest level of explanation was therefore found between roe deer bag two-years-past.

Reduction in the number of patients with neuroborreliosis, following a significant reduction in roe deer abundance on the island of Fuen, Denmark

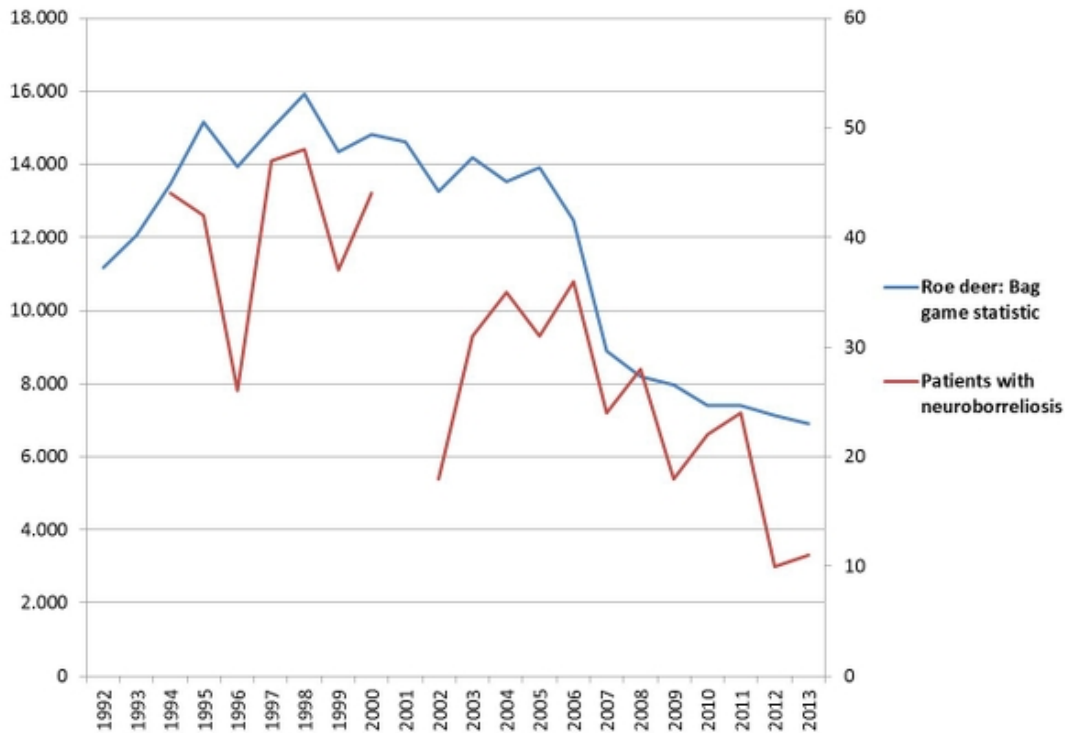


Figure 1: The blue line represents the bag game statistic on roe deer (*Capreolus capreolus*) on the island of Fuen, Denmark. The red line represents the number of hospitalized patients with neuroborreliosis on the island of Fuen, Denmark, except from the year 2001. The highest correlation was observed by assuming a two year delay from changes in the roe deer population to neuroborreliosis manifestation in the human population, as shown in the figure.

Conclusion

The reduction in roe deer abundance can explain up to 62% of the total variation in patients with neuroborreliosis on the island of Fuen in the period 1994 to 2013. The highest correlation was observed by assuming a two year delay from changes in the roe deer population to neuroborreliosis manifestation in the human population. The cause for the delay is defined by the development periods of the local tick population and difference in tick- instar host-preferences.

Notes:

Data from:

(A): The Department of Clinical Microbiology, Odense University Hospital, Denmark

(B): The National Patient Registry has data on patients hospitalized in Denmark.

(C): Centre for Environment and Energy, Aarhus University, Denmark.

*The data on neuroborreliosis from 2001 is not available.