The global seroprevalence of Neospora caninum infection in deer: a systematic review and meta-analysis study

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Abstract

Neosporosis, a parasitic infection caused by *Neospora caninum*, is one of the main contagious factors that cause reproductive disturbances in ruminants and neuromuscular complaints in dogs. Deer recognize as the important intermediate host of the *N. caninum* and plays a critical role in the reserve and dynamics of this parasite. Therefore, this review was performed to determine the global pooled seroprevalence of neosporosis in deer and related factors, including geographic area, climate, serological detection method, deer source and species. Data were systematically gathered without time limitation until 1 March 2021 from the following electronic databases: Pub Med, Springer, Google Scholar, Science Direct, Scopus, Embase, ProQuest, and Web of Science. According to the preferred reporting items for systematic reviews and meta-analyses (PRISMA) and inclusion criteria, 43 eligible studies were obtained from various countries. The funnel plot and Egger's test showed significant publication bias, and the Trim-and-fill method was used to correct the final meta-analysis. After correction, the overall seroprevalence of neosporosis in deer was 20.9% (95% CI 15–26.8), estimated by the random effect model. The *N. caninum* infection seroprevalence in deer was the highest in South America (29.8%, 95% CI 20.2–36.1), and the lowest in Europe (5.9%, 95% CI 4.1–7.7). The highest pooled seroprevalence estimation of neosporosis in deer based on diagnostic method subgroup was using NAT (29.8%, 95% CI 13.1–46.4). The pooled seroprevalence of neosporosis in P è re David's deer (42.3%, 95% CI 17.8–66.8) was higher than other deer species. The heterogeneity sources may be deer species and geographic regions based on meta-regression analysis. Understanding the epidemiology of *N. caninum* infection in deer as reservoir species is required. Furthermore, these results are suitable for managing and controlling this infection in deer.

Keywords: DeerMeta-analysis, Systematic review, Prevalence, Neosporosis, Neospora caninum