Risk factors associated with canine Distemper in Casilda, Argentina

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Abstract

Risk factors associated with canine distemper were investigated during a 1-year period at a Veterinary Hospital in Argentina using a logistic regression model. Forty-three (35.5%) of 121 examined dogs were diagnosed as clinical cases of canine distemper. One and two year-old dogs were at significantly (P<0.05) greater risk (*OR*s: 8.37 and 11.53, respectively) than dogs >5 years of age, and stray dogs were at significantly (P<0.05) greater risk (*OR*: 3.84) than dogs that were owned. Strategies that decrease the number of young, stray dogs, such as ownership programs, may prevent the occurrence of clinical canine distemper in this endemically-infected population.

Introduction

Canine distemper is one of the most important infectious diseases of dogs. It is caused by an RNA virus (canine distemper virus) belonging to the morbillivirus group of the family Paramyxoviridae. Although wild and domestic carnivores are the natural hosts of canine distemper virus, a wide range of species are susceptible to the infection, including sea mammals such as seals (Shell, 1990; van Moll et al., 1995; Barret, 1999). Canine distemper was first described in the 18th century, and canine distemper virus was first isolated in 1905. Canine distemper causes some of the highest mortality rates for canine infectious disease (Shell, 1990; Appel and Summers, 1995). Risk factors associated with its occurrence were investigated during a 1-year period at the Small Animal Hospital, School of Veterinary Medicine, National University of Rosario, Argentina, in the town of Casilda, in southern Santa Fe Province, about 350 km northwest of Buenos Aires.

Material and Methods

Diagnosis was based on clinical signs. This is the usual diagnostic method for canine distemper in veterinary clinical practice (Appel and Summers, 1995). A complete description of the clinical signs of canine distemper has been provided by Shell (1990). Data collected on potential risk factors for clinical disease detected at

the study site included age (1, 2, 3, 4 or ≥5 years), breed (pure or mixed), gender (male or female), ownership (stray or owned), vaccinated against canine distemper in the 12 months preceding examination at the Hospital (yes or no), whether the dog had ever been vaccinated against canine distemper (yes or no), frequency the dog is usually exercised outside the house (> once a day, once a day, 1-6 times a week, < once a week or never), how the dog is usually exercised (free, or on a leash), and season (summer, fall, winter or spring) that the dog was diagnosed.

Bivariate logistic regression models were fit to the data for each potential risk factor. Risk factors associated with canine distemper ($P \leq 0.2$) in bivariate analyses were further analysed in a multivariate logistic regression model, using a forward, stepwise algorithm ($P<0.05$). Fit of the model was determined using the Hosmer-Lemeshow statistic. Significance ($P \leq 0.05$) of the interaction between risk factors included in the final model and canine distemper was assessed. Records in which information on potential risk factors was missing were excluded from corresponding analyses.

Results

Forty-three (35.5%) of 121 examined dogs were diagnosed as clinical cases of canine distemper. Most of the cases occurred in winter, with a peak in August (87.5% month-specific prevalence). The model that best fit the risk of clinical canine distemper included age and domestic status (Hosmer-Lemeshow $\chi 2 = 2.5$; $P = 0.65$). One and two year-old dogs were at significantly ($P<0.05$) greater risk than dogs >5 years of age, and stray dogs were at significantly ($P<0.05$) greater risk than dogs that were owned (Table 1). An interaction between age and ownership was not significantly ($P = 0.1$) associated with the risk of being diagnosed with canine distemper. Although not statistically significant ($P>0.05$), increased risk for canine distemper was also associated with being unvaccinated (*OR*: 1.8), being unvaccinated during the previous year (*OR*: 1.8), being mixed breed status (*OR*: 1.8), and being diagnosed during fall (*OR*: 4.2) and winter (*OR*: 2.8) months.

Table 1: Risk factors for clinical canine distemper (cases) among dogs examined at the Small Animal Hospital, National University of Rosario (Casilda, Argentina) between June 2001 and May 2002, in a multivariate logistic regression model.

Variable	Category	Cases	Controls	Odds ratio	95% CI	P
Age (years)						0.004
	1	27	28	8.4	2.3, 30.8	
	2	8	8	11.5	2.8, 47.2	
	3	1	10	0.9	0.1, 10.2	
	4	1	4	4.9	0.5, 46.4	

	≥ 5	3	26	1	…	
Ownership						0.04
	Stray	9	9	3.84	1.1, 13.7	
	House	32	66	1	…	

Discussion

Although the association between season and canine distemper was not statistically significant in our study, the risk of being diagnosed was 3-4 times higher in winter and fall than in summer. This distribution is consistent with the epidemiology of airborne diseases, in which lower temperatures and higher humidity favors virus transmission.

Responsible care of dogs, including ownership programs that decrease the number of young, stray dogs, is the most effective strategy to prevent the occurrence of clinical canine distemper in this endemically-infected population. Although the association between risk of canine distemper and being unvaccinated was not statistically significant in the present study (perhaps as a consequence of low study power), the difference estimated between dogs that had never been vaccinated and for those dogs that had not been vaccinated during the previous year suggests that annual revaccination against distemper is important in reducing disease in endemically-infected populations.

References

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