

PREVALENCE OF *BORDETELLA BRONCHISEPTICA* INFECTIONS IN CATS FROM DIFFERENT ENVIRONMENTS

Voorkomen van Bordetella Bronchiseptica infecties bij katten uit verschillende biotopen

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ABSTRACT

The role of *Bordetella bronchiseptica* infections in respiratory disease in cats is not clear. In this study, the prevalence of *B. bronchiseptica* infections in cats in Flanders was determined. *B. bronchiseptica* was isolated from 11 out of a total of 272 nasal swabs taken from 272 cats from five different populations: household cats, cats from shelters, cats from catteries, stray cats and cats from pet shops. The infection rate of animals younger than 6 months was similar to that of older cats. The bacterium was isolated more frequently from cats kept in group and from cats showing signs of respiratory disease. None of the household cats were positive.

SAMENVATTING

De rol van *Bordetella bronchiseptica* infecties bij ademhalingsaandoeningen bij katten is nog onduidelijk. In deze studie werd de prevalentie van *B. bronchiseptica* infecties bij katten in Vlaanderen onderzocht. *B. bronchiseptica* werd geïsoleerd uit 11 neusswabs van 272 katten van 5 verschillende populaties: huiskatten, asielkatten, katten van catteries, straatkatten en katten van dierenwinkels. De kiem werd even frequent teruggevonden bij katten jonger dan 6 maanden als bij oudere dieren. Bij katten die in groep gehuisvest waren en bij katten met ademhalingsaandoeningen werd *B. bronchiseptica* frequenter geïsoleerd. Van de huiskatten werd er geen enkele positief bevonden.

Keywords: *Bordetella bronchiseptica* - Cat - Prevalence - Respiratory

INTRODUCTION

Bordetella bronchiseptica infections are commonly associated with respiratory disease in a number of different animal species: kennel cough in dogs, atrophic rhinitis in pigs and bronchopneumonia in rabbits and guinea pigs. In cats, infections of the upper respiratory tract are mainly caused by feline *Herpesvirus*, feline *Calicivirus* and *Chlamydomphila felis*. The role of *B. bronchiseptica* in respiratory disorders in cats is unclear. On the one hand, the bacterium has been isolated from cats with upper respiratory tract diseases, pneumonia and bronchopneumonia (McArdle *et al.*, 1994; Welsh, 1996; Coutts *et al.*,

1996). On the other hand, the bacterium has also been found in clinically healthy cats (Binns *et al.*, 1996; Coutts *et al.*, 1996).

Until now, the prevalence of *B. bronchiseptica* infections in cats has been recorded on only a very few occasions. The bacterium was isolated from 0 to 44% of the animals examined (McArdle *et al.*, 1994; Binns *et al.*, 1996). The aim of the present study was to determine the prevalence of *B. bronchiseptica* infections in different populations of cats in Flanders. For this purpose, nasal swabs were collected from animals both with and without clinical signs of respiratory disease.

Table 1. Prevalence of *B. bronchiseptica* infections in different groups of cats

Group	Number of positive cats / total number	
	> 6 months of age	< 6 months of age
Household cats	0 / 64	0 / 9
Cats from shelters	3 / 23	0 / 42
Cats from pet shops	0 / 0	0 / 12
Cats from catteries	4 / 32	3 / 40
Stray cats	1 / 46	0 / 4
Total (%)	8 / 165 (4.8%)	3 / 107 (2.8%)

MATERIALS AND METHODS

A total of 272 cats were sampled, distributed over five groups: household cats, cats from shelters, cats from catteries, stray cats and cats from pet shops. The data concerning the number of cats per group and age are summarised in Table 1. Each animal was clinically examined with special attention being given to the presence of nasal and ocular discharge, sneezing and coughing. Nasal samples were taken using fine cotton swabs (International Medical, Brussels) which were brought immediately to the lab in Amies transport medium and kept at 4°C. All swabs were inoculated on blood agar and provided with an antibiotic disc containing ceftiofur (Ceftiofur XNL, Neosensitabs, Rosco, Denmark). Moreover, 177 samples were also inoculated on selective *Bordetella* medium (Charcoal-Cephalexine agar, Oxoid, UK). Inoculated plates were incubated for 48 hours at 30°C. Colonies found to be resistant to ceftiofur and to possess the morphological characteristics of *Bordetella* were biochemically identified on the basis of the absence of acid production from glucose and lactose, the absence of indole production and the presence of oxidase and urease (Marcon 1995). The significance of different levels of prevalence among the five groups was assessed using the chi square test. A two-tailed Fisher exact test was applied to compare the prevalence of *B. bronchiseptica* infections between the cats that were

younger than 6 months and those that were older, and between the cats that had respiratory disorders and those that did not. Differences were considered significant when $p < 0.1$.

RESULTS

The results are summarised in Table 1. *B. bronchiseptica* was isolated from 11 cats. Three of the infected cats were younger than 6 months. No differences were found in the prevalence of *B. bronchiseptica* infections between the cats that were younger than 6 months and those that were older ($p > 0.1$). The prevalence of *B. bronchiseptica* was significantly higher in cats displaying respiratory disorders ($p < 0.5$). Signs of upper respiratory tract disease, characterised by ocular and/or nasal discharge, as well as by sneezing, were seen in 64 out of 272 cats. Of these 64 diseased cats, 6 were infected with *B. bronchiseptica*. Three of these 6 cats were younger than 6 months. Cats from catteries were infected more often than cats from the other four groups ($p < 0.1$).

DISCUSSION

In this study, *B. bronchiseptica* was isolated from 4.0% of the cats examined. The wide range of isolation results reported in the literature may be due to the sampling methods used, as well as to the age, housing

and condition of the animals. Oropharyngeal sampling, transtracheal flushing and isolation from the respiratory tract during autopsy reveal the presence of *Bordetella* more often than nasal sampling (Snyder *et al.*, 1973; Fisk & Soave, 1973; Willoughby *et al.*, 1991; Bemis, 1992; McArdle *et al.*, 1994; Binns *et al.*, 1996; Welsh, 1996; Coutts *et al.*, 1996). These sampling methods involve anaesthesia, however.

The infection rate in cats younger than 6 months of age was equal to that in older cats. This equally low prevalence in younger cats as in older cats does not seem to correspond to the higher susceptibility of kittens to infection with *B. Bronchiseptica* (McArdle *et al.*, 1994). Moreover, 76.6% of the cats younger than 6 months were housed in group. Because of frequent contacts between group members, cats housed in group are more often infected than individually housed animals (McArdle *et al.*, 1994). Our results confirm these literature data: 4.6% of the cats from shelters and 9.7% of the cats from catteries were infected, whereas none of the household cats were infected.

The bacterium was isolated from only 9.4% of the cats showing signs of respiratory disease, indicating that *B. bronchiseptica* infections play only a limited role in respiratory disorders in cats. On the other hand, cats infected with *B. bronchiseptica* more often showed signs of respiratory disease than uninfected cats (54.5 and 22.2% respectively). These results are similar to those from previous studies (Bims *et al.*, 1996).

REFERENCES

- Bemis D.A. (1992). *Bordetella* and *Mycoplasma* respiratory infections in dogs and cats. *Veterinary Clinics of North America: Small Animal Practice* 22, 1173-1180.
- Binns S.H., Dawson S., Speakman A.J., Bennett, M., Hart, C.A., Gaskell, R.M. (1996). *Bordetella bronchiseptica* in cats: preliminary survey results. *Veterinary Quarterly* 18, 45-46.
- Coutts A.J., Dawson S., Binns S., Hart C.A., Gaskell, C.J., Gaskell, R.M. (1996). Studies on natural transmission of *Bordetella bronchiseptica* in cats. *Veterinary Microbiology* 48, 19-27.
- Fisk S.K., Soave O.A. (1973). *Bordetella bronchiseptica* in laboratory cats from Central California. *Laboratory Animal Science* 23, 33-35.
- Marcon M.J. (1995). *Bordetella*. In: Murray P.R., Baron E.J., Tenover F.C. and Tenover F.C. (editors). *Manual of Clinical Microbiology, sixth edition*. American Society for Microbiology, Washington DC, 566-573.
- McArdle H.C., Dawson S., Coutts A.J., Bennett M., Hart C.A., Ryvar R., Gaskell R.M. (1994). Seroprevalence and isolation rate of *Bordetella bronchiseptica* in cats in the UK. *Veterinary Record* 135, 506-507.
- Snyder S.B., Fisk S.K., Fox J.G., Soave O.A. (1973). Respiratory tract disease associated with *Bordetella bronchiseptica* infection in cats. *Journal of the American Veterinary Medical Association* 163, 293-294.
- Welsh R.D. (1996). *Bordetella bronchiseptica* infections in cats. *Journal of the American Animal Hospital Association* 32, 153-158.
- Willoughby K., Dawson S., Jones R.C., Symons M., Daykin J., Payne-Johnson C., Gaskell R.M., Bennett M., Gaskell C.J. (1991). Isolation of *B. bronchiseptica* from kittens with pneumonia in a breeding cattery. *Veterinary Record* 129, 407-408.