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Prevalence of Intestinal Parasites in Dogs in the National Capital Region of Japan

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Abstract: A total of 475 canine fecal specimens collected in the national capital region (Tokyo, Kanagawa and Tochigi) of Japan were examined for eggs and oocysts of intestinal parasite. From the results, it appears that the prevalence of the parasitized dogs in Tokyo (3.0%) and Kanagawa (5.3%) areas was significantly lower than that in Tochigi (18.1%, $p<0.01$). The prevalence levels of helminth eggs in Tokyo, Kanagawa and Tochigi were as follows; Ancylostomacaninum (1.5, 2.2 and 5.6%), Trichrisvulpis (2.3, 2.2 and 4.4%) and Toxocaracanis (0, 0 and 5.7%, respectively). The proportion of dogs with intestinal parasites in Japan was very low as compared with the survey reports of some other countries.

Key words: Coprology, dog, helminth, urban, zoonotic, Japan

INTRODUCTION

The good health of many companion animals today can be attributed to greatly improved nutrition and newer veterinary therapeutics that have resulted in much improved control of many parasitic diseases (Irwin, 2002). In an urban companion animal practice, a veterinarian's management of parasitic diseases may require no further involvement than to routinely prescribe one of broad-spectrum antiparasitic drugs that have been marketed so effectively in recent years (Irwin, 2002).

Undoubtedly all vermicide drugs reflect modern society's need for convenience but unfortunately veterinarians do little to educate the pet owner about the value of strategic parasite control.

Because of the zoonotic importance of some helminths of dogs, new data on the prevalence of these parasites were collected. Recently, Bugg *et al.* (1999) and Fok *et al.* (2001) reported that the prevalence of gastrointestinal parasites in a sample of urban dogs in Australia and Hungary was 15.6 and 44.3%, respectively.

However, intestinal parasites of dogs have not been considered a serious problem in Japan in recent years. The aims of this study were to determine and compare the prevalence of dogs with intestinal parasites in Tokyo capital and its surrounding prefectures in Japan.

MATERIALS AND METHODS

A total of 475 canine fecal specimens were collected with help of companion animal hospitals in Tokyo capital, Kanagawa and Tochigi in the national capital region of Japan from June to October in 2001. The national capital region of Japan is made up of Tokyo and the seven prefectures including Kanagawa and Tochigi and positioned in the center of the Japanese archipelago (Fig. 1). The populations of Tokyo, Kanagawa and Tochigi were 12.17, 8.64 and 2.00 million in 2001, respectively.

The fecal samples from dogs were collected <24 h after defecation and were stored in 10% formalin neutral buffer solution at -18°C until examination. The coprological examinations were conducted by the direct smear method and the concentration methods which include saturated salt solution flotation and zinc sulfate flotation centrifugation and sucrose density-gradient centrifugation. The exploratory examination was performed at a magnification of x80 and eggs were counted under a magnification of x200 and x400. Data were analyzed by logistic regression analysis. The significance level was $p<0.05$. The logistic regression method is often used in modeling in epidemiology (Hsiehl *et al.*, 1998). Although, the method demands some additional information which is often difficult to obtain, it is a very useful tool in veterinary epidemiology (Broll *et al.*, 2002).

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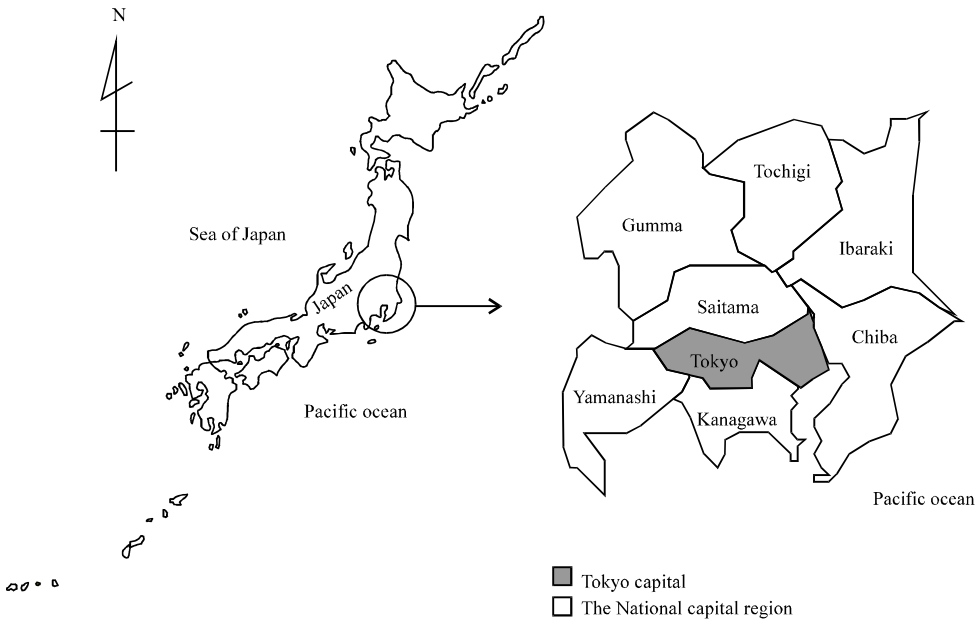

Fig.1: Situated in Tokyo capital and surrounding prefectures

RESULTS AND DISCUSSION

The proportion of dogs that were kept in-house in Tokyo, Kanagawa and Tochigi were 90.2, 69.1 and 72.8%, respectively. The frequency of dogs that were kept in-house in Tokyo was significantly higher than that for Kanagawa ($p<0.001$, odds ratio: 3.94) and Tochigi ($p<0.01$, odds ratio: 3.42). The examination of fecal samples shows that 3.0, 5.3 and 18.1% of dogs were parasitized by intestinal parasites in Tokyo, Kanagawa and Tochigi, respectively. The frequency of parasitized dogs in Tochigi was significantly higher than that for Tokyo ($p<0.001$, odds ratio: 7.19) and Kanagawa ($p<0.01$, odds ratio: 3.97). Although, the prevalence of parasitized dogs in Tochigi was close to the results of the survey carried out in Perth in Australia (Bugg *et al*., 1999), those in Tokyo and Kanagawa were much lower in the survey than in most of the reports (Bugg *et al*., 1999; Fok *et al*., 2001; Minnaar *et al*., 2002; Oliveira-Sequeira *et al*., 2002; Overgaauw, 1997; Overgaauw and Boersema, 1998; Schantz, 1999; Vanparijs *et al*., 1991).

The frequency of the different parasites in dogs is shown in Table 1. Toxocaracanis was the most prevalent parasite in Tochigi (5.7%) but it was not found in Tokyo and Kanagawa. This result was similar to those reported in Netherlands (Overgaauw, 1997; Overgaauw and Boersema, 1998) and Belgium (Vanparijs *et al*., 1991). On the basis of the high incidence of *T. canis*, it can be concluded that the environment in the surveyed areas

Table 1: Frequency of dogs with intestinal parasites in Tokyo, Kanagawa and Tochigi

	No. of infected dogs (Total dogs %)		
Parasites	Tokyo	Kanagawa	Tochigi
Ancylostomacaninum	2 (1.5)	2 (2.2)	14 (5.6)
Trichurisvulpis	3 (2.3)	2 (2.2)	11 (4.4)
Toxocaracanis	0 (0.0)	0 (0.0)	15 (5.7)
Strongyloidesstercoralis	0 (0.0)	0 (0.0)	4 (1.6)
Dipydiumcaninumand Taeniataeniaeformis	0 (0.0)	0 (0.0)	5 (2.0)
Spirometraerinacei	0 (0.0)	0 (0.0)	3 (1.2)
Isospora sp.	0 (0.0)	1 (1.1)	0 (0.0)
Giardia sp.	0 (0.0)	0 (0.0)	3 (1.2)
Cryptosporidium sp.	0 (0.0)	0 (0.0)	1 (0.4)

may be seriously contaminated with the infective form of this helminths species which raises the possibility of infection of human (Fok *et al*., 2001). Eggs of Ancylostomacaninum (5.6%) were more frequently found in Tochigi than in Tokyo (1.5%) and Kanagawa (2.2%). The frequency of dogs with Trichurisvulpis (4.4%) in Tochigi was twice as higher as that for Tokyo (2.3%) and Kanagawa (2.2%). In Tochigi, some dogs had been parasitized with Strongyloidesstercoralis (1.6%), Dipyidumcaninum and Taeniataeniaeformis (2.0%), Spirometraerinacei (1.2%), *Giardia* sp. (1.2%) and *Cryptosporidium* sp. (0.4%). However, these eggs or oocysts were not found in Tokyo and Kanagawa.

The sample size was similar to those reported by others (Bugg *et al*., 1999; Fok *et al*., 2001; Luty, 2001) and the results were compared with their reports. In this survey, it was suggested that the prevalence of dogs with intestinal parasites in Tokyo and Kanagawa of Japan were

very low as compared with the survey reports of urban areas in Belgium (Vanparijs *et al*., 1991), Hungary (Fok *et al*., 2001), Netherlands (Overgaauw, 1997) and Poland (Luty, 2001).

The majority of pet owners were aware of the potential risk to human health from canine helminths however, only one third were aware of the means of transmission to humans. The significance of zoonotic diseases caused by intestinal helminths makes it necessary to know the infection status of domestic dogs and to take measures for further control.

CONCLUSION

It is observed that veterinarians could play an important role in increasing the level of awareness of canine zoonotic parasites.

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