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Research Article

PREVALENCE OF *GIARDIA* INFECTION IN CATS AND ITS ZOONOTIC IMPORTANCE IN TABRIZ CITY, IRAN

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ABSTRACT
Giardiasis caused by the intestinal flagellate *Giardia duodenalis*. It is postulated that animals may be a reservoir for human infection and vice versa, thus, giardiasis classified as a zooanthroponotic disease. Therefore, accurate information about the *Giardia* infection in animals can help the control and prevention of disease in human. With respect to considerable population of cats in Iran and close relation to human, in the current study we tried to determine the infection rate of *Giardia* in stray, semi-stray and domestic cats. Ninthy two cat fecal specimens were collected and after formol-ether concentration, *Giardia*cysts were detected using light microscope. Fourteen samples (15.21%) out of 92 samples were *Giardia* cyst positive. The highest levels of infection with *Giardia* were in domestic cats (61.11%). The findings prominence the necessity for cat owners to have knowledge about zoonotic transmission of *Giardia*.

Keywords: *Prevalence, Giardia, Cat, Zoonosis, Iran*

INTRODUCTION
Giardiasis is a worldwide prevalent parasitic disease (Adam, 2001). The etiologic agent is *Giardia duodenalis* (syn. *G. intestinalis, G. lamblia*); (Astiazaran-Garcia *et al.,* 2000). *Giardia* is a flagellated protozoan. The parasite exists in both trophozoite and cyst forms. The infective form is the cyst. In Asia, Africa and Latin America approximately 200 million people have symptomatic giardiasis (Thompson *et al.,* 2000) with some 500, 000 new cases per year (World Health Organization, 1996). *Giardia* is a common cause of gastroenteritis and major health concern (Farthing, 1995) and is an importantcause of out breaks of waterborne infection (Marshall *et al.,* 1997).
The acquisition of *Giardia* occurs most commonly through ingestion of the cyst in contaminated water but person to person spread is common, particularly in settings of poor fecal-oralhygiene, food borne transmission occurs less commonly (Graczyk *et al.,* 2003).
Taxonomy of the genus is mainly based on morphology and, only recently, on genetic evidences. According these criteria, six species have been recognized in the genus *Giardia* until now: *G. agilis*in amphibians, *G. muris* and *G. microti* in rodents, *G. psittaci* and *G. ardeae* in birds and *G. duodenalis* in mammals. *G. duodenalis* is the only species found in humansas well as in other mammals, including domestic and farm animals such as dogs, cats, cattle, pigs, sheep and horses (Filice, 1952; Monis *et al.,* 1996).
The prevalence of *Giardia* by microscopy in domestic cats and kitten in Western Australia was 15.8% (McGlade *et al.*, 2003), 6% in USA (Nutter *et al.*, 2004), 7.2% in Iran (Anwar, 1974), 1% in Netherlands (Robben *et al.*, 2004), but surprisingly80% of cats tested by PCR were positive for *Giardia* in Australia (McGlade *et al.*, 2003).
Recently, concern about the public health has increased considerably, and while many potentially zoonotic organisms are associated with cat, enteric pathogens, also *G.duodenalis* are of particular concern (Thompson, 2002).
Evidence to support the zoonotic transmission of *G. duodenalis* is very strong. Therefore, accurate information about the *Giardia* infection in animals can help the control and prevention of it in human because of large numbers of cats in Iran and close relation between human and cat; in this study we tried to determine the infection rate of *Giardia* in cats Tabriz city of Iran.

MATERIALS AND METHODS

In these study 72 fecal samples from stray and semi-stray cats, 18 specimens from domestic cats and 2sample from pet shop were collected. Specimens from stray and semi-stray cats were collected freshly from cats which were in cage and some samples were gathered from places where feces were left. Samples from domestic cats were collected freshly by their owners. All the cats and samples were transferred to the Laboratory of Intestinal Parasitic Protozoa, Department of Veterinary Parasitology, Collage of Veterinary Medicine, Tabriz Branch, Islamic Azad University, Tabriz, Iran. Samples were examined by formol-ether concentration followed by microscopy.

RESULTS AND DISCUSSION

Results

The overall prevalence of *Giardia* was 15.21% (n=14), in stray and semi-stray cats 4.16% (n=3),and in domestic cats 61.11% (n=11). In stray cats we could not estimate their age. But all domestic cats and from pet shop were under 6 month old.

Table 1: Prevalence of Giardia cyst in different groups of cats

Groups of Cat	Number of tested cat	Number of infected cat with Giardia	% Prevalence of Giardiasis
Stray and semi- stray	72	3	4.16 %
Domestic	18	11	61.11 %
Pet	2	-	-
	92	14	15.21 %

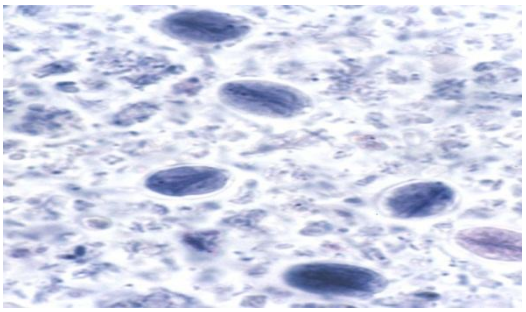

Figure 1: Giardia cysts in faeces of cats

Discussion

Based on what is known about the prevalence of *Giardia* in different animal species, including humans, and our current understanding of the major genetic groupings in *G. duodenalis*, there are four major cycles of transmission that maintain the parasite in mammalian host. However, we need to consider how these cycles may interact, and try to determine the frequency of transmission of zoonotic genotypes. However, the question of host specificity has not only had an important influence on *Giardia* taxonomy but also on the ongoing debut as to whether giardiasis is a zoonosis (Thompson, 2002). Recently, concerns about the public health dangers of pet ownership have increased considerably, and while many potentially zoonotic organisms are associated with cats; enteric pathogens are of particular concern (Hill *et al.*, 2000). There have been few detailed and comprehensive studies of the prevalence of gastrointestinal parasites in domestic cats and there is little information on the level of parasitic infection in domestic cats about parasites such as *Giardia*. Many previous surveys of feline parasites have been limited to stray cats (Coman *et al.*, 1984), and have been carried out in order to identify the significance of stray cats as potential reservoirs of infection (Calvet *et al.*, 1997). While preceding studies on the prevalence of *Giardia* in stray cats have yielded important results (Milstein and Goldsmid, 1997), it cannot be assumed that these results are indicative of the situation in domestic cats. In this study,

prevalence of *Giardia* in domestic cats was significantly higher than stray and semi-stray cats; also all domestic cats were less than six month old. The age of the cat was found to be an important risk factor associated with *Giardia* infection. These findings are similar to those obtained in a previous study (Wilson-Hanson and Prescott, 1982). The current study also found that the degree of contact that cats had with their owners, significantly influenced the prevalence of *Giardia* infection. *G. duodenalis* was the most prevalent enteric parasite in domestic cats. The high prevalence of *Giardia* detected by PCR is surprising for a number of reasons.

Traditional methods, such as microscopy, are commonly used by diagnostic facilities for identifying parasite stages in a fecal sample. When only one fecal sample is collected, prepatent infection in cats as well as intermittent shedding of parasite stages may lead to the underestimation of the prevalence of parasitic infections. Similarly, a low level of infection maygo undetected when using traditional microscopy methods (McGlade *et al.,* 2003). Evidence to support the zoonotic transmission of *Giardia* is very strong, but how frequent such transmission occurs and under what circumstances, has yet to be determined. *Giardia* cysts are remarkably stable, can survive for weeks to months in the environment. Further, the infective dose is low and even a single cyst can cause infection (Caccio, 2004; Zarebavani *et al.,* 2006), we should be aware that feline giardiasis could be transmitted to humans and most of the people does not know the modes of transmission to humans. Further studies are required in different endemicfoci in order to determine the frequency of such transmission. It is possible that domestic cats be a potential source of environmental contamination. A greater awareness of parasite contamination of the environment and its impact on health has precipitated the development of better detection method (GaredaghiYagoob, 2011; Slifko *et al.,* 2000).

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Competing Interests

Authors have declared that no competing interests exist.

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