

Epidemiological Study of Giardiasis in Diarrheic Calves in East-Azerbaijan Province, Iran

¹Yousef Davoudi, ²Yagoob Garedaghi and ³Saied Safarmashaei

¹Department of Clinical Science, Islamic Azad University, Sarab Branch, Sarab, Iran

²Department of Pathobiology, ³Faculty of Veterinary, Islamic Azad University, Tabriz Branch, Tabriz, Iran

Abstract: Neonatal calf diarrhea is a major health problem that has economical losses as a culling, emaciation and treatment costs. Giardiasis is an importance disease for calves and case of diarrheal disease in animals that cause dysentery in calves especially in 3 months old. This study was carried out on newborn calves in different parts of East Azerbaijan province due to 1 year. Five hundred fecal samples were taken from diarrheic calves under the age of months from 25 commercial dairy farms. After taking samples from rectum of the diarrheic calves, the samples kept in formalin 5% the samples were examined by direct test and concentration with formalin ether. The positive samples for Giardia were confirmed as 28% a significant difference was found between the prevalence rates in relation to the seasons of study ($p < 0.05$). The highest prevalence rate was in summer (37.6%) and the least rate was in winter (16.8%).

Key words: Giardiasis, calves, diarrheic, East Azerbaijan province, formalin ether, Iran

INTRODUCTION

Giardia is parasitic protozoans and an infection is common in domestic ruminants. Infections can lead to moderate to severe diarrhea with occasion mortalities. Clinical disease with Giardia occurs in calves between 1 and 3 weeks of age lasting 1-2 weeks in duration. Giardiasis is observed in calves older than 3 weeks of age and is chronic. These diseases have tremendous ability to be transmitted from animal to animal and from animal to humans. These infections have led to a significant environmental and public health concern. Giardia infections can be treated with benzimidazoles. Clearly, effective methods need to be employed to treat, prevent or control these diseases. It is one of the most commonly identified intestinal pathogens in humans and animals throughout the world. The infection is obtained after the microscopic infective cysts. Giardia is one of the most commonly identified intestinal pathogens in humans and animals in the world (Wolfe, 1992; Xiao, 1994). Recent studies have identified domestic livestock (e.g., cattle, sheep, pigs and horses) as major hosts for this parasite (Olson *et al.*, 1997). Clinical giardiasis is frequently not diagnosed yet they may be the most common cause of diarrhea in calves on some farms. In humans and some animals, clinical signs of Giardiasis include acute or chronic diarrhea, abdominal pain, dehydration, weight

loss and reduction in weight gain. The aim of present study was to determine the prevalence rate of Giardiasis in diarrheic calves in East-Azerbaijan Province.

MATERIALS AND METHODS

This survey is one cross-sectional study and from April 2010-2011 was done. In present study a total number of 500 fecal samples from different industrially farm in Tabriz area were taken. These fecal samples of diarrheic calves with age of <2 month during 4 seasons (every season 125 samples) for parasitology examination were collected. Fecal samples by swab or finger touch rectal were taken and after transferred to parasitology laboratory and then these samples by direct smear were studied. Of course for observation the internal stature of this parasite of logol were used. Values were represented as mean \pm SEM. Data were analyzed by one-way Analysis of Variance (ANOVA) followed by Dunnett's test using Statistical Package for Social Sciences (SPSS) version 10. $p < 0.05$ was considered significant.

RESULTS AND DISCUSSION

All results of present study consist of prevalence rate of Giardiasis in different ages and season in Table 1 and 2 have been shown. Giardiasis is caused by Giardia intestinalis (syn. *G. duodenalis*, *G. lamblia*)

Table 1: Prevalence rate of Giardiasis in fecal samples during different season

Season	Positive samples	No. of samples	Prevalence rate
Spring	37	125	29.6
Summer	47	125	37.6
Autumn	35	125	28.0
Winter	21	125	16.8

Table 2: Prevalence rate of Giardiasis in different age

Age (week)	Positive samples	No. of samples	Prevalence rate
1	18	115	15.65
2	27	134	20.14
4	28	93	30.10
6	36	101	35.64
8	31	57	54.38

which is one of the most commonly identified intestinal pathogens in humans and animals in the world (Adam, 1991; Zajac, 1992; Barr and Bowman, 1994; Roach *et al.*, 1993). Humans, dogs, cats and certain species of wild life are described as the principal hosts for *Giardia* (Adam, 1991; Zajac, 1992; Barr and Bowman, 1994; Roach *et al.*, 1993) however, *Giardia* infections in cattle, sheep, pigs and horses have been reported in many countries throughout the world (Xiao *et al.*, 1994; Buret *et al.*, 1990; Olson *et al.*, 1997). Diarrhea is the predominant clinical sign of giardiasis in calves, lambs, and horses (Xiao *et al.*, 1993, 1994; Olson *et al.*, 1995). It was shown in a previous study that giardiasis in domestic ruminants had a negative effect on performance, resulting in decreased rate of gain, impaired feed efficiency, lower carcass weights and increased time to slaughter (Olson *et al.*, 1995). Giardiasis is a chronic infection reported worldwide. The number of different species and the zoonotic potential of *Giardia* are controversial. There is circumstantial evidence that *Giardia* sp. which infects domestic animals can also infect people (Harris and Shearer, 2003). It appears that some *Giardia* isolates are infective to a variety of mammals while others are more species-specific. Wild animals may also be reservoirs. The parasite has been found in 1-39% of fecal samples from pet and shelter dogs and cats with a higher rate of infection in younger animals. This disease possesses economic ramifications due to the large impact on domestic animals such as cattle and sheep (Olson *et al.*, 2000, 2004). The role of animal transmission of human Giardiasis is unclear but the greatest risk of zoonotic transmission seems to come from companion animals such as dogs and cats (Thompson, 2004). The infected dairy cattle can also be an important reservoir for outbreaks in humans (Thompson, 2000).

CONCLUSION

According to results of present study maximum infestation of diarrhetic calves from season and age

aspects in summer and age of 8 weeks were observed, respectively. Contamination of water by dairy operations could be a potential source of human infection.

RECOMMENDATIONS

Giardia infections in dairy calves should be controlled not only to prevent disease and enhance performance but to avoid environmental contamination. Recently, we have shown that fenbendazole is highly effective in the treatment of giardiasis in dairy calves (O'Handley *et al.*, 1997). *Giardia* control should be considered as part of a dairy herd health program.

REFERENCES

- Adam, R.D., 1991. The biology of *Giardia* sp. *Microbiol. Rev.*, 55: 706-732.
- Barr, S.C. and D.D. Bowman, 1994. Giardiasis in dogs and cats. *Compend Contin Educ. Pract. Vet.*, 16: 603-614.
- Buret, A.G., N. den Hollander, P.M. Wallis, D. Befus and M.E. Olson, 1990. Zoonotic potential of domestic ruminants. *J. Infect. Dis.*, 162: 231-238.
- Harris, B.J. and J.K. Shearer, 2003. Parasite problems of dairy replacements. A Series of the Animal Science Department, Florida Cooperative Extension Service. Institute of Food and Agricultural Sciences, University of Florida.
- O'Handley, R., M.E. Olson, T.A. McAllister, D.W. Morck, M. Jelinski, G. Royan and K.J. Cheng, 1997. The efficacy of fenbendazole in treating *Giardia* infections in calves. *Am. J. Vet. Res.*, 58: 384-388.
- Olson, M.E., C.L. Thorlakson, L. Deselliers, D.W. Morck and T.A. McAllister, 1997. *Giardia* and *Cryptosporidium* in Canadian farm animals. *Vet. Parasitol.*, 68: 375-381.
- Olson, M.E., H. Ceri and D.W. Morck, 2000. *Giardia* vaccination. *Parasitol. Today*, 16: 213-217.
- Olson, M.E., R.M. O'Handley, B.J. Ralston, T.A. McAllister and R.C. Thompson, 2004. Update on *Cryptosporidium* and *Giardia* infections in cattle. *Trends Parasitol.*, 20: 185-191.
- Olson, M.E., T.A. McAllister, L. Deselliers, D.W. Morck, K.J. Cheng, A.G. Buret and H. Ceri, 1995. The effect of Giardiasis on production in a ruminant model. *Am. J. Vet. Res.*, 56: 1470-1474.
- Roach, P.D., M.E. Olson, G. Whitley and P.M. Wallis, 1993. Waterborne *Giardia* cysts and *Cryptosporidium* Oocysts in Yukon, Canada. *Applied Environ. Microbiol.*, 59: 67-73.

- Thompson, R.C., 2004. The zoonotic significance and molecular epidemiology of *Giardia* and giardiasis. *Vet. Parasitol.*, 126: 15-35.
- Thompson, R.C.A., 2000. Giardiasis as a re-emerging infectious disease and its zoonotic potential. *Int. J. Parasitol.*, 30: 1259-1267.
- Wolfe, M.S., 1992. Giardiasis. *Clin. Microbiol. Rev.*, 5: 93-100.
- Xiao, L., 1994. *Giardia* infection in farm animals. *Parasitol. Today*, 10: 436-438.
- Xiao, L., R.P. Herd and D.M. Rings, 1993. Infection patterns of *Cryptosporidium* and *Giardia* in calves. *Vet. Parasitol.*, 51: 41-48.
- Xiao, L., R.P. Herd and G.L. Bowman, 1994. Prevalence of *Cryptosporidium* and *Giardia* infections on two Ohio farms with different management systems. *Vet. Parasitol.*, 52: 331-336.
- Zajac, A.M., 1992. Giardiasis. *Compend Contin Educ. Pract. Vet.*, 14: 604-611.