Prevalence of Cryptosporidiosis in Foals and Humans to Be in Contact Them in Tabriz Area in Iran

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ABSTRACT

Cryptosporidium species are frequently associated with diarrhea among patients and dairy herds are a possible source of some of these infections. The environmental distribution Cryptosporidium spp. is dependent upon human and animal sources. This study examined parasite prevalence in foals and humans to be contact them in Tabriz area in Iran. Fecal samples were collected from 87 foals and 36 humans in the horse farms. Cryptosporidium oocysts were identified by using sheather's concentration and the Ziehl–Neelsen modified staining technique in 6 of 87 foals (6.89%) ranging from less than 6 months of age and 2 of 36 humans (5.55%) ranging from less than 1 year of age to older than 52 years of age. This study was achieved in 4 farms. Overall prevalence of infection was 6.89%, but higher in foals 2-4 months of age (7.73%) and this was statistically significant (P<0.05). Both sexes of foals were infected with Cryptosporidium parasites, but prevalence were higher in diarrheic than in non-diarrheic foals. There was no association between the detection of Cryptosporidium and other gastrointestinal parasites. These results indicate that Cryptosporidium is enzootic among foals, and suggest that foals could have a role in zoonotic cryptosporidiosis.

Key words: Cryptosporidiosis, foals, humans, Tabriz.

Introduction

The environmental distribution of Giardia spp. and Cryptosporidium spp. is dependent upon human, agricultural, and wildlife sources. The significance of each source with regard to the presence of parasites in the environment is unknown. Cryptosporidium parvum is a common protozoan pathogen with a worldwide distribution and it can cause severe and life-threatening diarrhea in an immunocompromised host. This protozoan was first recognized in the stomachs of autopsied mice [15] and first reported in an immunocompetent child and an immunosuppressed adult with diarrhea in 1976 [9,10]. Since then, cryptosporidiosis has become recognized as a highly prevalent opportunistic pathogen for immunocompromised humans. However, the huge waterborne outbreak affecting over 400,000 residents of South Milwaukee in 1993 [8] provoked a remarkable interest on cryptosporidiosis in immunocompetent people as well. In a review of over 130,000 presumably immunocompetent patients with diarrhea, Adal et al. [1] noted that 6.1% in developing areas and 2.1% in developed areas with diarrhea had Cryptosporidium infections. Among HIV positive patients with diarrhea, the percentages with Cryptosporidium infections rose to 24% and 14% [1]. In Korea, Cho et al. [5] reported 22% fecal oocyst positive rate out of 230 out patients of private hospital and Chai et al. [3] reported 7.9% from 3,146...
inhabitants. Recently, Seo et al. [13] reported 1.9% among 461 inhabitants. Transmission of C. parvum occurs mainly by the ingestion of oocysts either from fecal to oral contact or through contaminated food or drinking water. It has been known that cattle can be a source of Cryptosporidium infection. Rhee et al. [12] detected 111 (22.2%) cryptosporidiosis calves out of 500 dairy cattle and Wee et al. [17] found 29 (14.4%) oocyst positive calves among the 201 that he examined. Chai et al. [3] reported that 13 (93.3%) out of 15 cattle reared in endemic village were positive for C. parvum oocysts. In addition, C. parvum oocysts were detected in almost all of the environmental waters tested [13]. The present study was performed to investigate the infection status of cryptosporidiosis in normal inhabitants of Tabriz - Iran and reservoir hosts as their sources of infection.

Materials and methods

Fecal samples were collected from 87 foals and 36 humans in the horse farms in Tabriz area in Iran in 2009 to 2010. This study was achieved in 6 farms. Fecal smears were prepared from each sample by the formalin-ether concentration technique, stained by modified acid-fast procedure, and then examined for oocysts of C. parvum. Oocysts of 4-5 µm in diameter, red in color and containing sporozoites were considered positive for C. parvum. In searching for the source of human infection, fecal samples of livestocks reared in the village were collected. Cryptosporidium oocysts were examined after formalin-ether sedimentation and modified acid fast staining.

Result:

Cryptosporidium oocysts were identified by using sheather’s concentration and the Ziehl–Neelsen modified staining technique in 6 of 87 foals (6.89%) ranging from less than 6 months of age and 2 of 36 humans (5.55%) ranging from less than 1 year of age to older than 52 years of age. Overall prevalence of infection was 6.89%, but higher in foals 2-4 months of age (7.73%) and this was statistically significant (P<0.05). Both sexes of foals were infected with Cryptosporidium parasites, but prevalence were higher in diarrheic than in non-diarrheic foals.

Discussion:

Cryptosporidiosis, which is caused by Cryptosporidium parvum and was discovered in mice at the turn of the century, emerged as a frequently reported intestinal disease of animals and humans in the 1980s when its zoonotic potential was recognized. In recent years, the public has become aware of severe cryptosporidiosis because of its incidence in AIDS patients and because of massive outbreaks of cryptosporidial enteritis among the general populace worldwide from contaminated drinking water. Livestock and human wastes that were laden with oocysts of cryptosporidia have been incriminated in some cases. This study was achieved in 6 farms. Overall prevalence of infection was 6.89%, but higher in foals 2-4 months of age (7.73%) and this was statistically significant (P<0.05). Both sexes of foals were infected with Cryptosporidium parasites, but prevalence were higher in diarrheic than in non-diarrheic foals. There was no association between the detection of Cryptosporidium and other gastrointestinal parasites. Direct contact with infected animals is suggested to be an important mode of transmission of C. parvum is probably present in every domestic horse herd in the world with asymptomatic infections and prolonged oocyst excretion by adult horses recognized as a major and continuous source of environmental contamination [15]. These results indicate that Cryptosporidium is enzootic among calves, and suggest that calves could have a role in zoonotic cryptosporidiosis.
References