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☐ **Brief Communication** ☐

An epidemiological survey on *Cryptosporidium parvum* infection of inhabitants in Chorwon-gun, Kangwon-do

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Abstract: The present study was undertaken to know the infection status of *Cryptosporidium parvum* among the residents of Chorwon-gun, Kangwon-do in 1993. Total 461 fecal samples were collected from the inhabitants residing in Chorwon-gun during the period of August 12 to September 14, 1993. Fecal smears were prepared by formalin-ether sedimentation, and examined after modified acid fast staining. Of the 461 fecal samples, 9 (1.9%) were positive for *C. parvum* oocysts. The positive cases were limited to thirties (4) patients, forties (3), and sixties (2), and no oocyst was detected in other age groups. The oocyst positive rate for male was 1.4% and that of female was 2.6%.

Key words: *Cryptosporidium parvum*, infection status

The coccidian *Cryptosporidium parvum* is well known intestinal protozoa often causing severe life-threatening illness in immunocompromised individuals. Since the reported manifestation of *C. parvum* in laboratory mice by Chai et al. (1990), many studies on *Cryptosporidium* have been conducted in Korea. Rhee et al. (1991) reported the prevalence of *Cryptosporidium* spp. which ranged from 13.3% to 29.6% in various animals including mice, rats, pigs, dairy cattle, etc., and Wee et al. (1996) revealed 11.4% among 201 calves with diarrhea.

Livestocks, such as cattle, and drinking water are known to be important sources of infection. Human carriers without showing particular clinical symptoms have also important meaning in the epidemiological aspect. As a matter of fact, the epidemiological survey conducted in 1996 by Chai et al on *C. parvum* infection among healthy residents of Seoul and Chollanam-do, and the oocyst positive rates were 0.5% in and 10.6%, respectively. However, at the present, there are no available data with respect to *C. parvum* infection status from other areas in Korea. To clarify the infection status of *Cryptosporidium* in Korea, more efforts on epidemiological survey are necessary. The present study was undertaken to evaluate the infection status of *C. parvum* among the residents of Chorwon-gun, Kangwon-do. Data on the other parasite infection from stool examination of those residents have already been published in 1993 (Park et al., 1993).

Fecal samples (461 total) were collected from the inhabitants residing in Chorwon-gun during the period of August 12 to September 14, 1993. Fecal smears were prepared by formalin-ether sedimentation, and examined after modified acid fast staining (Casemore et al., 1985). The smears were observed by light

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microscope for the presence of *Cryptosporidium* oocyst. The age of the studied population ranged from 2 to 89, and the number of people in their fifties was the highest (119 persons). Of the sample examined, 271 were males and 190 were females.

Of the 461 fecal samples, 9 (1.9%) were positive for *Cryptosporidium* oocysts. The positive cases were limited to the people in their thirties (4 patients), forties (3), and sixties (2), and no oocyst was detected in other age groups. The peak positive rate was recorded in the age group 30-39 (4.8%), followed by 40-49 (4.1%). The oocyst positive rate for male was 1.4%, and that of female was 2.6%. All positive inhabitants to *C. parvum* were negative to helminthic ova or other protozoan cyst.

Over the past decade, the role of *Cryptosporidium* as the agent of human diarrhea has been redefined from that of a rare opportunistic pathogen to a possible causative organism for mass infection by water-borne transmission route. Soave and Johnson (1988) reported prevalences of 0.6-20% in western countries and 4-20% in developing countries. According to the report by CDC (1996), *Cryptosporidium*, along with *Giardia* spp., were responsible for 40% of US water borne outbreaks during the period 1993-1994, for which an etiological agent was found.

In Korea, however, such an outbreak has not been reported so far. This is probably due to difficulties in proper diagnosis of cryptosporidiosis, rather than the true absence of *Cryptosporidium* outbreak. Outbreaks of cryptosporidiosis in humans are often due to direct contact with infected animals, but many cases are associated with contacting contaminated water supplies (Pohjola et al., 1986). In fact, waterborne transmission of *Cryptosporidium* spp. is favored by many factors including a low infection dose, large number of infective oocyst shed by infected animal, resistance of oocyst to most environmental conditions and water treatment, and the small size of the oocyst (Smith, 1990).

Table 1. The prevalence of *Cryptosporidium parvum* infection by age of the inhabitants of Chorwon-gun, in 1993

Age group	No. of exam. (M/F)	No. of Positive (%)
0-9	22 (11/11)	0 (0.0)
10-19	31 (19/12)	0 (0.0)
20-29	32 (28/4)	0 (0.0)
30-39	84 (51/33)	4 (4.8)
40-49	74 (33/41)	3 (4.1)
50-59	119 (62/57)	0 (0.0)
60-69	63 (45/18)	2 (3.2)
70<	16 (14/2)	0 (0.0)
unknown	20 (8/12)	0 (0.0)
Total	461 (271/190)	9 (1.9)

All the nine positive patients with *C. parvum* in this study were over 30 years old. Logar et al. (1996) reported that the positive rate of *C. parvum* was higher in older age groups (>14) than in younger age groups (<14). Furthermore, according to the study of Chai et al. (1996), a peak positive rate was noted in the age groups 51-60 and 61-70, 13.2% and 15.9%, respectively. It is not clear why the older age group is more susceptible to *C. parvum* than the younger people. One possible reason is that the active working population who are ready to *Cryptosporidium* infection in the rural area is mainly older age group. Since there are no effective drug therapies for *Cryptosporidium*, the prophylaxis is most important. For this purpose, the source of infection should be investigated more intensively and proper control measures against the sources should be established in the future. However, prior to these, the nationwide epidemiological survey is essential for the exact knowledge of infection status of *C. parvum* in our country. From the present study, it was revealed that *C. parvum* was infected in 1.9% of the inhabitants of Chorwon-gun, Kangwon-do.

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