## Abstract

## A Study on the Necessity of Monitoring Enteric Protozoa as a Cause of Acute Diarrhea

Ju Jung-Won, Kwon Ji-young, Seo Ji-hye, Lee Hee-il

Division of Vectors and Parasitic Diseases, Bureau of Infectious Disease Diagnosis Control, Korea Disease Control and Prevention Agency (KDCA)

**Background:** Protozoa containing *Entamoeba histolytica, Giardia lamblia, Cryptosporidium parvum* and *Cyclospora cayetanensis* are known to be the causative agents of diarrhea in humans. These protozoans are transmitted by the fecal-oral route and are infected commonly by the consumption of contaminated food and water. This study reported on the surveliance results of parasitic protozoans in patients with acute diarrhea and informed the necessity of monitoring enteric protozoa.

**Methods:** A total of 2,598 subjects with acute diarrhea were tested through the polymerase chain reaction (PCR) method to detect four species of protozoa including the detection of Microsporidia in some subjects. *Kudoa septempunctata* were analyzed through the PCR method in acute food poisoning subjects.

**Results:** From 2,598 subjects, 10 subjects (0.38%) were positive. Among these, *C. parvum* and *C. cayetanensis* was detected in 9 subjects (0.35%) and 1 subject (0.04%), respectively. Out of 94 acute diarrhea specimens, 29 (30.9%) subjects were found for Microsporidia spp. and 6 (6.4%) subjects for *E. intestinalis*. In 70 cases of food poisoning, 178 subjects were requested for *K. septempunctata* and 92 subjects (51.7%) were positive.

**Conclusions:** In 2019, the protozoa detection rate for patients with diarrhea in Korea was not high compared to other countries. Recently, there have been no outbreaks by enteric protozoa infection, but the risk of intestinal protozoa infection is rising due to overseas travel and increased imports of agricultural products. Furthermore, a new type of protozoan was identified in patients with acute diarrhea and in patients with food poisoning. For the risk management of intestinal protozoa infection, this study intends to improve detection methods for accurate diagnosis and plans to establish a more advanced surveillance system.

Keywords: Enteric Protozoa, Acute Diarrhea, Polymerase Chain Reaction (PCR)

Table 1. The gene subtypes of *Cryptosporidium* spp. based on sequences of the 60 kDa glycoprotein gene (GP60) in the positive cases in 2019

Cryptosporidium spp. subtypes	No. of positive cases
II aA17G2R1	4
II aA15G2R1	2
II aA17G1R1	1
II aA15G2R1	1
II aA18G3R1	1



Figure 1. Cryptosporidium subtypes based on sequences of the 60 kDa glycoprotein gene (GP60) in 41 positive cases from 2017 to 2019

No. of specimens		Microsporidia spp.	E. intestinalis	
		15 -	No. of positive (%)	No. of positive (%)
Sex	Male	51	17 (33.3)	49 (3.9)
	Female	43	12 (27.9)	39 (9.6)
	Total	94	29 (30.9)	88 (6.4)

Table 2. The detection rate of Microsporidia spp. and E. intestinalis in samples of patients with acute diarrhea

Table 3. The test request status and detection rate of *Kudoa septmepunctata* in samples suspected of food poisoning from 2017 to 2019

Year	No. of cases	No. of positive cases (%)	No. of specimens	No. of positive specimens (%)
2017	107	58 (55.1)	302	95 (31.5)
2018	109	60 (55.5)	306	119 (38.9)
2019	70	47(67.1)	178	92 (51.7)