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Clinical Report

A CASE REPORT OF AN OVERSEAS-TRAVELER'S DIARRHEA PROBABLY CAUSED BY *CHILOMASTIX MESNILI* INFECTION

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Abstract: Many active flagellates were detected in stool samples of a 22-year-old Japanese male who traveled China and India. Microscopic observation showed that the organisms stained with Wright's solution were pyriform or rounded in shape, measuring 11.7-17.5 μm in length and 7.9-12.2 μm in width. The posterior end was pointed. Three free anterior flagella were located in the front end. A spherical nucleus was situated near the anterior pole. Based on these morphological features we identified the organisms as trophozoites of *Chilomastix mesnili*, a common intestinal protozoon. Although we examined viral, bacterial and parasitic infections other than *C.mesnili*, no pathogen was found. From these results obtained, it was considered to be highly probable that *C.mesnili* infection was the cause of the diarrhea.

INTRODUCTION

Reflecting recent advancement in international interchange and traveling abroad, imported cases with infectious diseases have been increasing in Japan. Annually most of these cases are bacterial diarrhea (Yoh and Honda, 1995). It has been pointed out that Japanese inhabitants in tropical countries have a high risk of infection with intestinal parasites, because of contamination of drinking water or food (Tsukidate *et al.*, 1985). *Chilomastix mesnili* is a species of flagellate protozoa of the digestive tracts and is basically thought to be a harmless commensal. However there is a report suggesting pathogenicity of *C.mesnili* (Mueller, 1959). The prevalence of *C.mesnili* infection ranges from less than 1% to 10% or more in the area of warm climates (Beaver *et al.*, 1984). In this paper, we report a case of a patient with diarrhea possibly caused by *C.mesnili*.

CASE REPORT

The patient was a 22 year-old, male student living in Kochi Prefecture, Japan. He traveled China and India from the end of July to September 1st, 1995. During the stay in India, he had fever on August 28th, followed by diarrhea and nausea. On September 1st, he returned to his home town, Kochi, and visited a physician because of continuing diarrhea. Immediately he was transferred to the Kochi General Hospital of Agricultural Cooperation. The symptom of the patient was diarrhea and nausea. The body temperature was 37.2°C at the time of admission.

Laboratory data are shown in Table 1. C-reactive protein (CRP) was 10.5 mg/dl. Other data of blood chemistry were not remarkable except for a little increase of LDH and uric acid. The urine examination showed a little increment in acetone bodies. The peripheral blood picture was normal. We could not detect antibody against *Entamoeba histolytica* using a hemagglutination test (Japan Lyophilization Laboratory, Tokyo, Japan). Results of fecal examination for bacteria and fungi are shown in Table 2. Feces appeared like mud with mucus. *Escherichia coli* and *Citrobacter amalonaticus*, indigenous intestinal bacteria, were detected by fecal culture. Diarrheagenic *E.coli* was not detected. Serum antibodies against various viruses were examined by neutralization tests (NT) or complement fixation tests (CF) (Table 3). Antibodies against influ-

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Table 1 Laboratory data on September 1st, 1995

1) Blood chemistry		3) Peripheral blood cell counts	
TP	7.8g/dl	RBC	507×10^4/mm³
A/G	1.69	Ht	46.1 %
Glu	95mg/dl	Hb	15.5g/dl
ALP	158IU/l	Plt	18.6×10^4/mm³
T-Cho	116mg/dl	WBC	7200/mm³
γ-GTP	16IU/l	4) Peripheral blood picture	
T-Bil	0.5mg/dl	Band	2.0%
ChE	248mg/dl	Seg	62.0%
Alb	4.9g/dl	Eos	0.0%
Glb	2.9g/dl	Baso	0.0%
GPT	24IU/l	Lymph	22.0%
GOT	26IU/l	Mono	12.0%
LDH	431IU/l	Aty-Lymp	2.0%
CPK	90IU/l	5) Serological test	
BUN	20mg/dl	CRP	10.5mg/dl
Crn	0.8mg/dl	6) Urine analysis	
UA	8.6mg/dl	Pro	20mg/dl
Amy	89IU/l	Glu	0mg/dl
2) Immunoglobulins		Ket	10mg/dl
IgG	1260mg/dl	Occult	(−)
IgA	310mg/dl	7) HA test	
IgM	131mg/dl	*E. histolytica* antibodies	(−)

Table 2 Examination of bacteria and fungi of the fecal sample on September 1st, 1995

Bacteria and fungi	Culture media*	Results
Culture of feces		
E. coli	A	(+)
C. amalonaticus	A	(+)
P. shigelloides	A	(−)
Salmonella spp.	B, C	(−)
Shigella spp.	B, C	(−)
Viblio cholerae	D, E	(−)
Viblio parahaemolyticus	D, E	(−)
Campylobacter	F	(−)
Fungi	G	(−)
Diarrheagenic *E. coli*†		
Enteropathogenic *E. coli* (EPEC)		(−)
Enteroinvasive *E. coli* (EIEC)		(−)
Enterotoxigenic *E. coli* (ETEC)		(−)
Enterohemorrhagic *E. coli* (EHEC)		(−)

* A: BTB agar; B: SSB agar; C: SS agar; D: TCBS agar; E: Viblio agar; F: Skirrow agar; G: Sabouraud agar.
† Agglutination test by serum groups.

Table 3 Serological examinations of antibodies against viruses

Viruses	Methods*	Antibody titers† Sept. 1‡	Sept. 7‡
Influenza A virus	CF	8	8
Influenza B virus	CF	<4	<4
Rotavirus	CF	<4	<4
Enterovirus 72	NT	32	32
Adenovirus 1	NT	64	64
Adenovirus 2	NT	64	64
Adenovirus 3	NT	4	4
Adenovirus 4	NT	<4	4
Adenovirus 7	NT	<4	<4

* CF: complement fixation tests; NT: neutralization test
† 4 or more is positive
‡ Admission (Sept. 1), Discharge (Sept. 7)

enza A virus, enterovirus 72, adenovirus 1, adenovirus 2, adenovirus 3, and adenovirus 4 were detected.

Parasitological examination was made by using fecal samples. In a direct smear specimen of feces many active and motile flagellates were observed under a microscope (Fig. 1). When a fecal sample was diluted tenfold with saline, the number of the organisms was approximately 60 per high power field (400×). The spiral form was recognized in organisms (Fig. 2). The morphology of the flagellates stained with Wright's solution was pyriform and rounded in shape, measuring 11.7 to 17.5 μm long and 7.9 to 12.2 μm wide. Three free

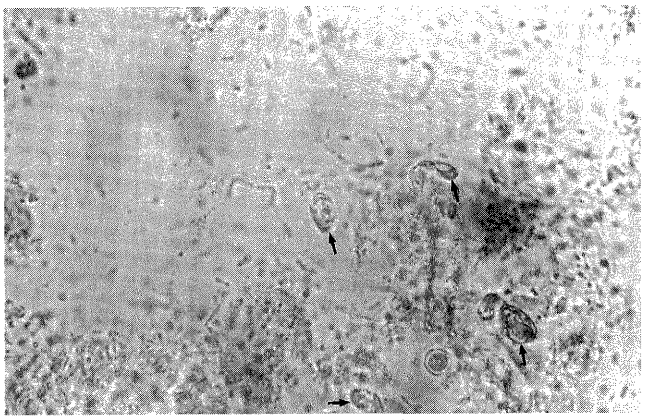

Figure 1 Motile trophozoites with three flagella of *Chilomastix mesnili* (arrows) were observed on a direct smear of fecal specimen from the patient (400×).

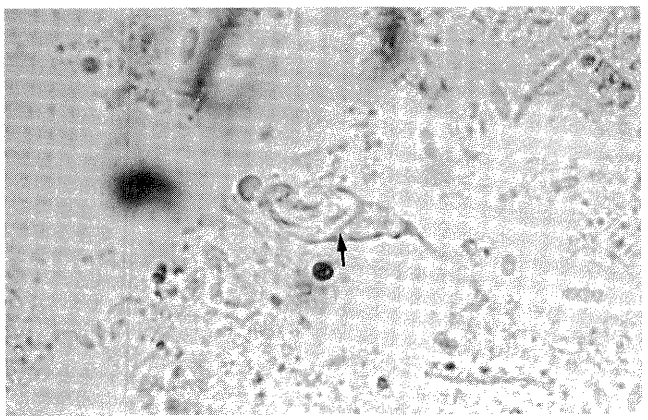

Figure 2 Spiral groove of *C.mesnili* was observed on a direct smear specimen (1000×).

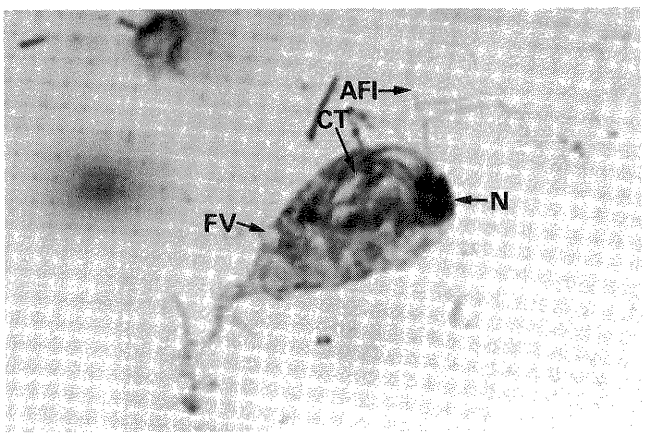

Figure 3 A specimen of *C.mesnili* trophozoite stained with Wright's solution. Various organelles such as flagella (AFI), cytostome (CT), nucleus (N) and food vacuoles (FV) are observed (1000×).

anterior flagella were equal in length and located at the front end. The posterior end was pointed. A spherical nucleus, measuring 2.7 to 4.2 μm, was present near the anterior pole. A well-difined cytostome was seen on one side of the nucleus. The cytoplasm contained numerous food vacuoles. But this flagellates had no undulating membrane and axostyle. Based on these morphological features, we identified the organisms (Fig. 3) as trophozoites of *Chilomastix mesnili* (Wenyon, 1910).

Fecal samples were also examined by formalin-ether sedimentation (MGL method), or were cultured in Tanabe-Chiba medium. Neither protozoa nor helminths except *C.mesnili* were detected by these trials.

The patient was treated with 750 mg/day of metronidazole and 2 g/day of cefmetazole sodium, and 4 g/day of anti-diarrhoics from September 1st (Fig. 4). The parasites were not detected in fecal samples after 4th day of the treatment. No cysts of the parasite were found throughout the clinical course.

Discussion

Chilomastix mesnili has a cosmopolitan distribution. The infection occurs by swallowing the cysts of the parasite (Kreier,1978). *C.mesnili* infection is known to be endemic in many tropical areas where sanitation and personal hygiene are bad (Clarke *et al.*, 1974; Chacin-Bonilla *et al.*,1993). It has been thought generally that *C. mesnili* is a normal inhabitant of the cecal region of the large intestine, where the trophozoites live on enteric bacteria in the lumen of the glands, and that *C.mesnili* is a harmless commensal and is not responsible for symptoms (Beaver *et al.*, 1984). However, infections with *C. mesnili* have been observed in diarrhea of children

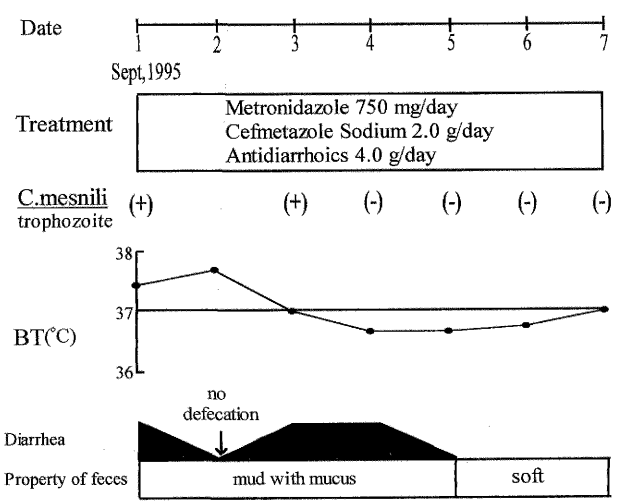

Figure 4 Clinical course of the patient.

(Červa and Větrovská, 1958), homosexual patients (Peters *et al.*, 1986), HIV (human immunodeficiency virus) positive populations (Mendez *et al.*, 1994) and a visitor from the United States who stayed in a developing country (Mueller, 1959). This suggests that *C. mesnili* might be pathogenic to immunocompromised, or less resistant hosts.

In the present case, pathogenic intestinal bacteria, helminths and protozoa were not detected except for *C. mesnili*. Serum antibodies against viruses were detected by complement fixation tests and neutralization tests. A slight increase of titers was seen against adenovirus 4 during hospitalization. We can not exclude the possibility that diarrhea in this case was caused by the viral infection. However, it should be noticed that the score of titration was the lowest level at the recovery stage (Table 3). No cysts were found in fecal samples throughout the present observation. It is possible that the metronidazole acted effective by on the trophozoites. In the literature, a similar case report was mede by Mueller (1959).

In conclusion, we reported that the *C.mesnili* infection accompanied the severe diarrhea in the Japanese patient who possibly did not have immunity to the intestinal protozoa. When the international interchange of personnel and the imported cases of diarrhea have been increasing, *C.mesnili* should be considered as one of the possible pathogens for so-called traveler's diarrhea.

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