

INTESTINAL CAPILLARIASIS : A CAUSE OF CHRONIC DIARRHEA AND HYPOALBUMINEMIA

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Abstract. Seventeen cases of intestinal capillariasis in Srinagarind Hospital, Khon Kaen University, Thailand were reviewed. The mean age was 40.41 years with a range from 21 to 69 years. Most cases had intermittent or continuous voluminous watery diarrhea for one month to three years with hypoalbuminemia. Borborygmi, vague abdominal pain, weight loss and pedal edema were significant associated symptoms. Fecal examination was the most useful for diagnosis by finding the *Capillaria philippinensis* ova in all cases. Mebendazole 400 mg per day for 20 to 28 days is the treatment of choice. Usually, relapse and death are unusual, inadequate treatment is a major factor.

INTRODUCTION

Human intestinal capillariasis is a helminthic disease caused by the nematode *Capillaria philippinensis*. The clinical features are characterized by abdominal pain and chronic intractable diarrhea followed by weight loss, muscle wasting, weakness, and if untreated, severe muscle wasting, edema, cachexia and death (Whalen *et al*, 1969). The first documented case of intestinal capillariasis in Thailand was reported in 1973 (Bradatsundarasar *et al*, 1973). After that, there were sporadic case reports from different part of the country (Sanpakit *et al*, 1974; Muangmanee *et al*, 1977; Bhaibulaya *et al*, 1977; Prakritritranon *et al*, 1980; Kunaratnapruk *et al*, 1981). The first epidemic in Thailand occurred in 1981 in a small village, Sisaket Province (Kunaratnapruk *et al*, 1981). The diagnosis was revealed by ova or adults of *C. philippinensis* on fecal examination. Mebendazole was considered as the antihelminthic drug of choice (Singson *et al*, 1975). This report discusses 17 cases of *C. philippinensis* who presented with chronic diarrhea at Srinagarind Hospital, Khon Kaen University, Thailand.

MATERIALS AND METHODS

The case notes of 17 chronic diarrhea patients with *C. philippinensis* who were diagnosed at Srinagarind Hospital from January 1983 to December 1991 were reviewed retrospectively. Thirteen cases

were admitted to the Department of Medicine and the other four were treated at the Outpatient Department.

For each case, the diagnosis of capillariasis was based on either positive ova or adults of *C. philippinensis* from fecal examination. The characteristic peanut shaped, pitted shelled and biperculated ova of *C. philippinensis* about $45 \times 20 \mu\text{m}$ in size (Whalen *et al*, 1969) were found in all cases, adults of *C. philippinensis* were found only in one case. The result of treatment was evaluated by symptoms and fecal examination.

RESULTS

The mean age of the 17 patients was 40.41 years with a range from 21 to 69 years. Seventy-six % of the patients were 20-49 years of age. Thirteen patients were male (M : F ratio of 3.25 : 1), who were commonly infected than females. Five patients lived in Roi Et Province, the others were distributed in 6/17 provinces in northeastern Thailand, indicating wide spread distribution of this parasite. Most patients were farmers.

Clinical features

Symptoms : Most patients presented with intermittent or continuous diarrhea. The duration of diarrhea vary from one month to three years, in the majority was 2 to 4 months. Patients had 2 to 5 and occasionally more than six times, voluminous

watery stool per day. The associated symptoms were borborygmi, vague abdominal pain and severe weight loss from 4 to 20 kilograms during the symptom. Anorexia was presented in 76.47%, but nausea and vomiting were less common in 11.76%, 64.70%, respectively (Table 1).

Physical findings : The most common clinical picture was increase bowel sounds (borborygmi) in 94.11% (Table 2). Muscle wasting and pedal edema were presented in 88.24%. Anemia presented in 47%. Usually the blood pressure was low and 35.29% of the patients were in shock on admission. Fever, ascites and hepato-splenomegaly were unusual clinical features.

Laboratory findings : The most useful laboratory procedure was fecal examination, in which the characteristic ova of *C. philippinensis* were found in all cases although repeated examination of stool samples (or concentrating technique) had to be done before the ova could be identified in some cases. Adult worms were found in only one case. Occasionally, *Strongyloides stercoralis*, hookworm ova and *Opisthorchis* ova were found. Hypoalbuminemia was found in all cases. The mean plasma albumin level was only 1.66 g/dl. The mean plasma potassium was 3.2 mEq/l. Severe anemia and eosinophilia were unusual. Stool fat, D-xylose test and long GI studies were done in 61.54%, an abnormal D-xylose test was recorded in 4/4 cases. The abnormal finding in long GI studies was intestinal mucosal edema, compatible with a malabsorption pattern.

Treatment and clinical course

Nine and five patients were treated with oral mebendazole 400 mg per day for 28 and 20 days, respectively. Two patients were treated with oral mebendazole 200 mg per day for 5 and 7 days, respectively. Relapse or reinfection occurred in 3 patients and there was one death, due to inadequate treatment and loss to follow up.

DISCUSSION

Diarrhea is a very common problem in Thailand, causing significant morbidity and mortality. The etiology was not established in most cases, especially in chronic diarrhea. It is possible that

C. philippinensis could be responsible for some cases, especially if diarrhea is chronic, resulting in severe protein-calorie malnutrition or electrolyte disturbance. More than 200 confirmed cases from at least 19 provinces in Thailand have been reported (Kunaratnapruk *et al.* 1983; Chunlertrith *et al.* 1988) and 17 cases from 7 provinces in north-eastern Thailand are included in this report. So it is apparent that intestinal capillariasis is not rare disease in Thailand.

The habit of eating raw foods, especially fish, among these people provides an excellent means for the transmission of many parasites, and *C. philippinensis* is another to be added to the list. The characteristic symptoms for diagnosis is intermittent or continuous voluminous watery diarrhea associated with borborygmi, vague abdominal pain and severe weight loss. Muscle wasting, pedal edema and increase bowel sounds are the most useful physical findings. The most useful diagnosis is identified of *C. philippinensis* ova or adult worm from fecal examination, so repeated fecal examination to find the characteristic ova should be done before preceeding to other sophisticated investigations. Hypoalbuminemia was a consistent finding in all cases; other abnormal findings which may be present in intestinal capillariasis are hypokalemia, presence of stool fat and reduced D-xylose absorption.

The pathophysiological process in capillariasis seems to be entirely due to alterations in gastrointestinal function. The severe protein-losing enteropathy, severe mineral depletion with loss of potassium, sodium and other vital electrolytes, severe losses of fat, carbohydrates and proteins in the stools of patients with *C. philippinensis* are the results of diarrhea, malabsorption and maldigestion. Watten *et al.* (1972) have shown impaired carbohydrate absorption, impaired fat digestion, and impaired digestion or absorption of protein.

Intestinal capillariasis responds promptly to treatment with mebendazole 400 mg per day for 20-28 days. Aggressive fluid replacement and total parenteral nutrition are unnecessary, except in the case of severe malnutrition. Usually relapse and death are uncommon, inadequate treatment is a major factor when it does occur.

Experimentally, various species of fresh-water fishes in Thailand can serve as intermediate hosts and fish eating birds can be reservoir hosts (Bhai-

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Table 1
Clinical findings in 17 cases of *C. philippinensis*.

No.	Age (year)	Sex	Duration of symptoms (month)	Frequency of stools (per day)	Borborygmi	Abdominal pain	Weight loss (kg)
1	44	F	2	4-5	+	+	4
2	24	M	3	2-5	+	+	7
3	48	F	2	3-5	+	+	5
4	24	M	8	2-8	+	+	19
5	42	F	2	2-3	+	+	12
6	25	F	24	10	+	+	10
7	69	M	4	4-5	+	+	14
8	52	M	12	3	+	+	7
9	33	M	24	4-5	+	+	15
10	64	M	3	3-4	+	+	6
11	31	M	12	3-4	+	+	8
12	54	M	4	4-5	+	-	5
13	36	M	2	4-5	+	+	12
14	49	M	1	4-5	+	+	14
15	30	M	8	5-6	+	+	15
16	21	M	7	4-5	+	+	20
17	41	M	36	3-4	+	+	6

+ = Present; - = Absent

Table 2
Physical and laboratory findings in 17 cases of *C. philippinensis*.

No.	BP	Bowel sound	Pedal edema	Muscle wasting	Hct (%)	Albumin (g%)	Globulin (g%)	Potassium (mEq/l)
1	90/60	increase	+	+	34	0.9	-	2.7
2	100/60	increase	+	+	25	2.0	2.2	3.7
3	100/80	increase	+	+	43	1.8	-	-
4	90/60	increase	+	+	34	2.2	-	2.8
5	90/60	increase	+	+	43	0.9	3.2	4.1
6	70/40	increase	+	+	25	1.5	2.1	4.4
7	70/40	normal	+	+	-	2.7	3.8	3.2
8	90/50	increase	+	+	-	-	-	-
9	90/60	increase	-	+	48	1.8	3.2	3.3
10	80/60	increase	+	+	43	1.5	2.3	3.6
11	90/50	increase	+	+	40	1.2	2.1	3.1
12	110/70	increase	+	+	35	1.8	2.3	3.2
13	90/60	increase	+	-	43	2.1	4.2	3.4
14	80/60	increase	+	+	33	1.7	3.1	2.8
15	60/40	increase	+	+	32	1.4	1.7	2.1
16	80/60	increase	+	+	32	1.6	3.6	3.1
17	100/60	increase	-	-	45	1.5	1.9	3.0

+ = Present; - = Absent

bulaya *et al*, 1979). Doctors in this part of Thailand should exclude the diagnosis of intestinal capillariasis in any case of chronic diarrhea or malabsorption syndrome by repeated fecal examination.

REFERENCES

- Bradatsundarasar A, Pecharanond K, Chintanawongs C, Ungthavorn D. The first case of intestinal capillariasis in Thailand. *Southeast Asian J Trop Med Public Health* 1973; 4 : 131-4.
- Bhaibulaya M, Benjapong W, Noeypatimanond S. Infection of *Capillaria philippinensis* in man from Petchabun province, Northern Thailand : A report of the fifth case. *J Med Assoc Thai* 1977; 60 : 507-9.
- Bhaibulaya M, Indra-Ngarm S, Ananthapruti M. Fresh water fishes of Thailand as experimental intermediate hosts for *Capillaria philippinensis*. *Int J Parasitol* 1979; 9 : 105-8.
- Chunlertrith K, Mairiang P, Sukeepaisarnjaroen W. Chronic diarrhea in Srinagarind Hospital. *Srinagarind Hosp Med J* 1988; 3 : 35-9.
- Kunaratnapruk S, Iam-ong S, Chatsirimongkol C. Intestinal capillariasis : The first epidemic in Thailand. *Ramathibodi Med J* 1981; 4 : 209-13.
- Kunaratnapruk S, Iam-ong S, Chatsirimongkol C, Dhirasut C, Laohanuwat C. Intestinal capillariasis in Sisaket Province : A report of 100 cases. *Ramathibodi Med J* 1983; 6 : 253-8.
- Muangmanee L, Aswapokee N, Vanasin B. Intestinal capillariasis. Report of the fourth case in Thailand. *Siriraj Hosp Gaz* 1977; 29 : 439-49.
- Prakitrittranon W, Eua-ananta Y, Dhiensiri T, Bhaibulaya M. Intestinal capillariasis from Maha Sarakham province, northeast Thailand : Report of a case. *Southeast Asian J Trop Med Public Health* 1980; 11 : 496-7.
- Sanpakit S, Suksungvol S, Bhaibulaya M. Intestinal capillariasis from Saraburi province, Thailand : Report of the second case. *J Med Assoc Thai* 1974; 57 : 453-60.
- Singson CN, Banzon TC, Cross JH. Mebendazole in the treatment of intestinal capillariasis. *Am J Trop Med Hyg* 1975; 24 : 932-4.
- Whalen GE, Strickland GT, Cross JH, *et al*. Intestinal capillariasis- a new disease in man. *Lancet* 1969; 1 : 13-6.
- Watten RH, Beckner WM, Cross JH, Gunning JJ, Jaramillo J. Clinical studies of *Capillaria philippinensis*. *Trans R Soc Trop Med Hyg* 1972; 66 : 828-34.