

COMPOSTELA VALLEY: A NEW ENDEMIC FOCUS FOR CAPILLARIASIS PHILIPPINENSIS

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Abstract. A 20 year old female from Compostela Valley Province in the Philippines, presenting with chronic diarrhea, borborygmi, bipedal edema, anorexia and weight loss was seen at Davao Regional Hospital. Her stool specimen, suspected by a local medical technologist to have *Capillaria philippinensis* ova, was forwarded to the Diagnostic Parasitology Laboratory of the College of Public Health, University of the Philippines Manila. It was examined and found to contain *Capillaria philippinensis* adults, larvae and eggs. Twelve deaths among people coming from the same *barangay*, affected by a similar illness with no definite diagnosis except "gastroenteritis" were also reported. These prompted health officials to send a team that would investigate the etiology of the disease outbreak labeled as a "Mystery Disease".

Seventy-two stool samples from symptomatic patients were examined. Fifty-three (73.6%) individuals were proven to harbor at least one parasite with 16 (22.2%) individuals positive for *Capillaria philippinensis* infection. Ocular inspection, interviews and focus group discussions revealed that the people's eating habits are not much different from the habits of those from the Ilocos provinces where capillariasis was initially described. In both areas, people are fond of eating *kinilaw* or raw fish. They also eat raw shrimps, crabs and snails. Furthermore, the people defecate in the field or in the same body of water where they get the fishes, shrimps, crabs and snails that they eat, thus completing the life cycle of *Capillaria philippinensis*. Fish-eating birds were likely to have spread this parasite to the area. This is the first report of a capillariasis outbreak in Compostela Valley Province, and this should alert health authorities to consider embarking on serious efforts for developing proficiency of laboratory and clinical diagnosis especially in government health facilities where the poor and marginalized sectors of society are likely to consult.

INTRODUCTION

Intestinal capillariasis or capillariasis philippinensis is caused by a small nematode known as *Capillaria philippinensis*. Symptoms of this illness are diarrhea (at least 4-5 watery stools per day), borborygmi and abdominal pain. The patient may also experience weight loss, malaise, anorexia and vomiting with cachexia and bipedal edema in severe cases. This helminthic infection was virtually unknown until 1963 when Chitwood reported the first case, a schoolteacher from Bacarra, Ilocos Norte. He had a history of an intractable diarrhea for 3 weeks with ascites, emaciation and cachexia and later died at the Philippine General Hospital in Manila (Chitwood *et al*, 1964).

Although relatively uncommon, intestinal capillariasis may occur in epidemic proportions. In the 1960s, a capillariasis outbreak occurred in Tagudin, Ilocos Sur in the Philippines where more than a thousand people acquired the disease and of which almost a hundred died (Cross *et al*, 1970). Another epidemic was recorded in Southern Leyte in the Philippines in the early 1980s (Cross and Basaca-Sevilla, 1984). In the recent

past, several deaths from among persons affected by an unspecified diarrheal disease from *Barangay* Awao in Monkayo, Compostela Valley Province were reported. A stool sample from a 20 year old female, also a resident of the same *barangay* and presenting with a similar illness manifesting as chronic diarrhea, borborygmi, anorexia, weight loss and bipedal edema was examined by a local medical technologist who suspected it to contain *Capillaria* ova. The same specimen was preserved and forwarded to the Diagnostic Parasitology Laboratory of the College of Public Health, University of the Philippines Manila where *Capillaria* eggs, larvae and adults, as well as *Heterophyes* eggs were noted. This prompted health officials to send a team from the Department of Health (DOH) and the College of Public Health, University of the Philippines Manila (UPM) that would conduct an investigation so that the disease outbreak may be further investigated.

MATERIALS AND METHODS

The municipality of Monkayo is in Compostela Valley Province, which used to be part of Davao

del Norte and is about 120 km north of Davao City. The actual site of the study was *Barangay Awao* which is located 41 km away from the Monkayo Town Proper and is 59 km away from the nearest government hospital in the province, the Montevista District Hospital. The *barangay* is divided into 16 *puroks* or zones and has a population of 3,695.

Seventy-two patients complaining of on and off diarrhea associated with borborygmi, weight loss, bipedal edema, and/or anorexia, submitted stool specimens. The specimens were processed and examined using the direct fecal smear (DFS) and acid ether concentration technique (AECT) (de Leon, 1998).

An ocular inspection of the area, key informant interviews, focus group discussions as well as interview and physical examination of patients were conducted.

RESULTS

A total of 72 stool specimens from symptomatic individuals were processed and examined by the team. Fifty-three individuals (73.6%) of those examined were found to be infected with at least one parasite, with 24 (45.3%) of them presenting as single parasitic infections and 29 (54.7%) having multiple parasitic infections.

Both helminthic and protozoan infections were commonly encountered with parasites having the same modes of infection occurring together in many individuals examined. The most common parasite seen was hookworm (27.8%), while second was *Capillaria* and *Endolimax nana* (both 22.2%). *Heterophyes* and *Entamoeba histolytica* ranked as the third most common organisms. The breakdown of the parasitic infections diagnosed is in Table 1.

Capillaria was found in 16 people giving a parasite rate of 22.2%. It was found in both males and females and in different age groups, not only affecting adults but also children. Ages of infected individuals ranged from 4 to 59 years with a mean age of 26.1 years (SD = 17.7 years) (Table 2). In 12 out of 16 patients or 75% of confirmed cases, *Capillaria* eggs were already noticeable on the direct fecal smear examination.

The most common clinical manifestations found among affected individuals were: chronic

diarrhea, borborygmi, and bipedal edema. One severely affected individual, a 31 year old female who had been ill for 4 months, easily fit the classical description of the clinical manifestations of capillariasis philippinensis – chronic diarrhea, borborygmi, bipedal edema, anorexia, weight loss, and cachexia.

Environmental sanitation was found to be generally poor with only 66% of households having

Table 1
Parasites found using either direct fecal smear or acid ether concentration technique, Awao, Monkayo, Compostela Valley 15 September 1998.

| Parasite seen (n=72) | No. | % |
|------------------------------|-----|------|
| Hookworm | 20 | 27.8 |
| <i>Capillaria</i> | 16 | 22.2 |
| <i>Endolimax nana</i> | 16 | 22.2 |
| <i>Heterophyes</i> | 12 | 16.7 |
| <i>Entamoeba histolytica</i> | 12 | 16.7 |
| <i>Entamoeba coli</i> | 10 | 13.9 |
| <i>Ascaris</i> | 6 | 8.3 |
| Coccidians | 3 | 4.2 |
| <i>Enterobius</i> | 3 | 4.2 |
| <i>Giardia</i> | 3 | 4.2 |
| <i>Trichuris</i> | 2 | 2.8 |
| <i>Trichomonas hominis</i> | 1 | 1.4 |
| <i>Echinostoma</i> | 1 | 1.4 |
| <i>Blastocystis</i> | 1 | 1.4 |

Table 2
Age and sex distribution of patients with capillariasis, Awao, Monkayo, Compostela Valley 15 September 1998.

| Age (years) | Male (%) | Female (%) | Total (%) |
|-------------|-----------|------------|------------|
| 0-14 | 2 (25.0) | 3 (37.5) | 5 (31.3) |
| 15-30 | 1 (12.5) | 4 (50.0) | 5 (31.3) |
| 31-45 | 2 (25.0) | 0 (0.0) | 2 (12.5) |
| 46-60 | 3 (37.5) | 1 (12.5) | 4 (25.0) |
| >60 | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Total | 8 (100.0) | 8 (100.0) | 16 (100.0) |

Age range : 4 to 59 years old; Mean age : 26.1 years; Median age : 24.0 years; SD : 17.7

toilets, most of which were of the pit privy type. Some of the latrines were even found to be close to the river. Many people defecate in the fields or in the river, with the latter being a rich source of freshwater fishes, shrimps, crabs, and snails which are consumed by the local people. Sources of water consist of open wells, water pumps, and springs, some of which were noted to be not too far away from latrines.

Farming is the main occupation in the area, although fishing is also done mostly to derive a source of food in the community. Corn, rice, coconut, coffee, and banana are the main crops in the community. Harvest in the past several months had been described by local folks as having been poor due to lack of rainfall. The effects of *El Niño* had been markedly felt such that community folks have had to consume more readily available food coming from the river in the past several months.

Kinilaw is commonly eaten by people of all ages and both sexes in the community. Raw freshwater fish dipped in vinegar and seasoned with salt and ginger is a common viand as well as *pulutan*, a dish taken with alcoholic beverages. Freshwater shrimps, crabs and snails are also eaten raw. The river provides considerable amount of food for the villagers: *buriring*, *paitan*, *dalag*, (mudfish), *tilapia* (St Peter's fish), *pantat* (catfish), *saluysuy* (swordfish), *ulong* (shrimp), *kagang* (mountain crab), and *kuhol* (Golden snails). Fish may also be bought from rolling stores more popularly known as "fish-car".

DISCUSSION

Although majority of reported capillariasis philippinensis cases in the Philippines have been from the coastal provinces of Northern Luzon (Hinz, 1985), its presence reported in Southern Leyte and Northern Mindanao does not discount the possibility of other endemic foci yet to be described. Furthermore, with migratory fish-eating birds as natural reservoirs of infection, the geographic distribution of the disease may be wider than what is now known. These migratory birds could infect fishes in fresh and brackish waters that are along the birds' migratory paths. Once introduced, the infection may be established, and a localized epidemic could easily occur especially in a setting where fresh- and brackish water fishes are eaten raw.

This can be one of the possible answers to the question as to why capillariasis was described in *Barangay Awao* only in the relatively recent past.

Capillariasis could have been endemic in the *barangay* for quite some time now but due to a number of constraints, among them, lack of proficiency of local health staff in clinical and laboratory diagnosis, and a general lack of awareness of this potentially fatal parasitic infection, it had been left undiagnosed. Superstitious beliefs are common among people in the area. This disease outbreak for instance, was believed by many to be a result of witchcraft.

The rise in the number of cases of capillariasis could have been attributed to the local eating habits and possibly coupled with the changing weather conditions. In *Awao*, raw freshwater fishes are commonly eaten by people of all ages and of both sexes. It is a common viand as well as *pulutan* (a dish which goes with alcoholic beverages) in the community. This also possibly explains the presence of *Capillaria* among people of different age groups and of both sexes unlike in the 1960s capillariasis epidemic in Ilocos when the cases were generally males above 10 years old. In addition, due to poor harvests in the past several months as an effect of the *El Niño*, the people have had to consume more readily available food especially those that came from the river, thus increasing the local folks' chances of acquiring the infection.

The most common behavior pattern observed among infected people in the different endemic areas is their eating habits. Therefore, a change in the eating habits, *eg*, eating of raw or insufficiently cooked fish, is the key in the prevention and control of capillariasis. This however has been shown to be difficult to accomplish even with educational campaigns done in the past. In Northern Luzon, even those who have been educated reason out that "cooking destroys the flavors they relish as well as some of the nutritive value of the food, and furthermore, their ancestors have had these unique eating habits for generations and they seemed to have lived full lives" (Cross and Bhaibulaya, 1983). Complicating this difficulty are superstitious beliefs which are still considered as causing disease outbreaks.

Aside from dietary habits, it was also noted that sanitary conditions in *Awao* are not much different from those in other capillariasis endemic

areas, eg, Ilocos and Thailand (Cross and Bhaibulaya, 1983). Indiscriminate defecation has been pointed out by some experts to be one of the factors that could have played a major role in the 1967-68 intestinal capillariasis epidemic in Tagudin, Ilocos Sur. Although there are some pit privies and water sealed toilets in Awao, some local folks still prefer to defecate near the river. The presence of other food- and water-borne parasites as well as soil-transmitted helminths strongly suggests that food, water and soil in the *barangay* could be heavily contaminated with feces resulting in a high potential for transmission of these parasites to humans.

Good clinical and laboratory diagnosis should help in identifying and recording of new cases as well as relapse cases which should help in planning out more effective control strategies in the future. Such a strategy should aim to identify infected individuals early, thereby, reducing if not eliminating the chances of developing complications which could result in mortality. Environmental sanitation and community hygiene are also important for eventual control.

There is a need for health and government officials to continue to provide opportunities for continuing education of their medical and laboratory staff. This will help to ensure that capabilities in diagnosis, treatment, prevention, and control of endemic diseases are upgraded; thus, ensuring a high quality of service even to people of low socio-economic status.

Lastly, health education and awareness campaigns should aim to make people understand and accept that consumption of raw fish is the mode of infection. In addition, such campaigns should encourage local people to submit to diagnostic tests and treatment as the need arises.

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