

CRYPTOSPORIDIOSIS IN PHILIPPINE CHILDREN

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INTRODUCTION

Cryptosporidia are coccidian parasites first described by Tyzzer (1907) from the gastric glands of mice and subsequently reported from a wide variety of vertebrates (Levine, 1973). Although several species of *Cryptosporidium* have been named (Levine, 1973) experimental evidence suggested that it may only be a single-species genus (Tzipori *et al.*, 1980; Angus, 1983), but there may be strain variations (Tzipori, 1983).

The parasite infects the epithelial cells of the gastrointestinal tract causing pathologic lesions and diarrhea. It can also be found in cells of the respiratory tract of some vertebrate hosts. Infections in humans were first recognized in 1976 (Nime *et al.*, 1976), and although the immunological status of this patient was not reported, infections reported thereafter were in patients immunocompromised either by disease or by therapy (Weinstein *et al.*, 1981). A number of patients with the acquired immune deficiency syndrome (AIDS) have been found infected with the parasite (Centers for Disease Control, 1982) with subsequent infections reported from non-immunocompromised patients with diarrhea (Jokipii *et al.*, 1983; Casemore and Johnson, 1983; Tzipori *et al.*, 1983).

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Since *Cryptosporidium* infection had not been recorded from the Philippines and elsewhere in Southeast Asia, the following study was done to determine whether the parasite could be found in persons with diarrhea in the Philippines.

MATERIALS AND METHODS

Stool specimens were collected from patients with diarrhea seen at the San Lazaro Hospital in Manila. Initially stools were examined by a sugar flotation method and Giemsa stained air dried, methanol fixed fecal smears. No cryptosporidia were found with these methods and subsequently the Ziehl-Neelson acid-fast method was used and oocysts were found. In later studies the modified Kinyoun acid-fast staining procedure was the method of choice (Ma and Soave, 1983). Fresh or formalin fixed stool specimens were smeared onto glass microscope slides, air dried and stained.

RESULTS

Stools were examined from 735 persons one month to 75 years of age from August 1983 until early December 1984. *Cryptosporidium* oocysts were found microscopically in Ziehl-Neelson or modified Kinyoun stained fecal smears from 19 (2.6%) patients, all children, 6 to 20 (av. 9.5) months of age; 10 males and 9 females. No infections were found in approximately 30 adults. The number of oocysts found in the stools varied from a few to many per microscopic field. All of the patients had diarrhea of one to several days duration and while complete medical histories were not

available many of those with *Cryptosporidium* infection had nausea, vomiting, abdominal cramps, abdominal discomfort and flatulence. Most had four or more bowel movements within a 24-hour period prior to being seen at the hospital. All patients were dehydrated except one and all were rehydrated by oral therapy. Eight of the children had *Ascaris lumbricoides*, three *Trichuris trichiura* and two with occult blood in the feces.

Children with infection were from Metro-Manila except three coming from nearby Rizal or Cavite provinces. No attempt was made to follow-up the patients. Most were released or absconded from the hospital in an improved condition, before the diagnosis was made; usually 12 to 24 hours following rehydration.

DISCUSSION

Until recently cryptosporidiosis was considered an opportunistic parasitosis usually found in immunocompromised persons especially those with the acquired immune deficiency syndrome. In 1983 Jokipii *et al.*, reported finding *Cryptosporidium* oocysts in fecal samples from immunocompetent patients with symptoms of a gastrointestinal infection. Nine percent of 154 fecal samples examined for *Cryptosporidium* were positive for oocysts and the author questioned whether the parasitosis was not the single most common parasite causing abdominal symptoms in Finland and possibly elsewhere. Travel abroad was associated with the onset of the illness in many of these patients. Elsewhere, in the United States, Current *et al.*, (1983) reported *Cryptosporidium* infection in immunocompetent persons who had direct contact with feces from infected calves, and in Australia Tzipori *et al.*, (1983) found 36 of 884 (4%) hospitalized patients with oocysts in their stools. Children were more commonly infected than adults. Hojlyng *et al.*, (1983)

also recovered the parasite more often from Liberian children 6 to 12 months of age than from older children 1 to 5 years of age. In other studies, Casemore and Jackson (1983), Casemore *et al.*, (1984), Nichols and Thom (1984) and Hunt *et al.*, (1984) detected the parasite in the feces of children and others with diarrhea in the United Kingdom while in Costa Rica, Mata *et al.*, (1984) reported finding *Cryptosporidium* oocysts in 4.3% of children with diarrhea. The authors associated severity of infections among urban children with the absence of breast feeding; infections were not found during the first year of life in rural infants who were breast-fed.

More recently cryptosporidiosis was detected in children attending day-care centers in the United States (Centers for Disease Control, 1984), and Ma *et al.*, (1985) diagnosed the disease in four persons with diarrhea who had returned to the United States from a seven-day vacation on a Caribbean island.

The means of transmission of *Cryptosporidium* is not completely known. It is without question a zoonotic disease with a little host specificity, infecting a myriad of animal life, but at the same time spread from one person to another (Casemore and Jackson, 1984). The latter is especially true for persons suffering from acquired immune deficiency syndrome. In the study by Pitlik *et al.*, (1983) of 43 cases of human cryptosporidiosis, 23 immunodeficient and 16 with intact immune systems, animal exposure was almost exclusively recorded for the latter group. Ma *et al.*, (1985) suggested that some persons may become infected by eating or drinking contaminated food or water.

Many of the immunocompromised patients with cryptosporidiosis have died. In most cases, however, the individuals also had concomitant infections with other disease agents (Pitlik *et al.*, 1983). Most immunocompetent

persons, on the other hand, do not have severe

CASEMORE, D.P. and JACKSON, B., (1984).

disease; the parasitosis is usually short lasting and infections resolve spontaneously (Case-
more and Jackson, 1983). In patients reported
in this study, all were children and all ap-
parently recovered from their diarrhea follow-
ing oral rehydration.

Cryptosporidium infections should be con-
sidered in the differential diagnosis of diar-
rheal disease in children and in adults with
animal contact or with travelers diarrhea.
In all probability once the parasite is consid-
ered and specific methods used for diagno-
sis, reports of the disease will probably in-
crease.

SUMMARY

Cryptosporidiosis, a newly recognized
parasitosis of humans is being identified with
increased frequency in immunocompromised
and more recently in immunocompetent
persons with gastroenteritis and or diarrhea.
It has been found in the Philippines for the
first time in children seen at the San Lazaro
Hospital in Manila. A total of 735 stool
specimens from adults and children with
diarrhea were examined by the Ziehl-Neelson
and Kinyoun acid-fast methods and 2.9% of
the children 6 to 20 months of age were found
passing *Cryptosporidium* oocysts. This para-
sitic infection should be considered in the
differential diagnosis of cases of diarrhea in
both immunodeficient and immunocompetent
persons.

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