

10. PROTOZOAN AND PARASITIC OPPORTUNISTIC INFECTIONS

Microsporidia is responsible for 40% of chronic diarrhoea in PLWHA in Zimbabwe, Cryptosporidia for 10%, Isospora for 2% and Giardia for 2%.

10.1 Cryptosporidiosis

Cryptosporidiosis is an intestinal infection caused by a protozoan parasite, usually self-limiting in immunocompetent patients. It produces profuse, watery diarrhoea with abdominal cramping in immunocompromised patients. Cryptosporidium may also cause cholangitis, and, rarely, infection in sites outside the GI tract. Patients complain of some combination of diarrhoea, abdominal pain and cramping, flatulence, nausea, vomiting, fever, anorexia, weight loss, and/or malaise. Diarrhoea may be acute and self-limiting or chronic and recurrent.

Infection is spread by ingestion of contaminated water, including swimming / boating / rafting incidents. Symptoms usually last more than 2 weeks. Stools are watery and without gross blood.

The diagnosis is made on finding oocysts in appropriately stained stool preparations and in aspirates obtained from upper and lower GI endoscopy. If cholangitis suspected, consider abdominal ultrasound to detect biliary ductal dilatation, and/or endoscopic retrograde cholangiopancreatography (ERCP)

Management

Non-drug related treatment

As most chronic diarrhoeas relating to HIV are not treatable, the most important thing is to prevent them. This can be done by hand hygiene, boiling all drinking water (including that which is used to brush teeth), peeling all fruit, cooking all meat and vegetables and not eating raw lettuce, cabbage or salads.

Drug-related treatment

- No specific therapy is available for treating the infection. Most patients experience symptom improvement or remission on ART.

- Provide supportive care and symptomatic relief through:
 - Fluid and electrolyte replacement
 - Antidiarrhoeals, such as loperamide
 - Antispasmodics
 - Antiemetics
- Paromomycin sulfate 1gm PO BID, PLUS azithromycin 600 mg PO OD for 4 weeks has helped some patients; after four weeks give paromomycin alone, 500 mg po bid. This regimen has not been curative.

10.2 Microsporidiosis

A number of different strains of microsporidia are pathogenic in humans (Table 10.1).

Table 10.1 Different species of microsporidia and illnesses caused by them	
Microsporidian species	Clinical manifestation
Enterocytozoon bienersi	Diarrhoea, acalculous cholecystitis
Encephalitozoon intestinalis (syn. Septata intestinalis)	Infection of the GI tract causing diarrhoea, and dissemination to ocular, genitourinary and respiratory tracts
Encephalitozoon hellem and Encephalitozoon cuniculi	Keratoconjunctivitis, infection of respiratory and genitourinary tract, disseminated infection
Vittaforma corneae (syn. Nosema corneum), Nosema spp. (N. connori and N. ocularum)	Ocular infection
Trachipleistophora hominis and Pleistophora sp.	Muscular infection
Microsporidium (M. ceylonensis and M. africanum)	Infection of the cornea

Human microsporidiosis represents an opportunistic disease, occurring mainly, but not exclusively, in severely immunocompromised patients with AIDS. The clinical manifestations of microsporidiosis are very diverse, varying according to the causal species with diarrhoea being the most common.

Enterocytozoon bieneusi and *Encephalitozoon intestinalis* are commonly associated with diarrhoea in persons with HIV infection and are difficult to eradicate. Diarrhoea may be acute and self-limiting or chronic and recurrent. Microsporidia can cause infection in sites other than the GI tract including the bronchial tree, the paranasal sinus, the cornea and conjunctivae and the gall bladder and renal tract.

Management

Non-drug related treatment

Prevention of infection by avoiding ingesting spores of microsporidia is most important. This may be achieved by safe and hygienic practices, including drinking uncontaminated water, peeling all fruit, cooking all meat and vegetables and not eating raw lettuce, cabbage or salads. Avoid close contact with pets.

Drug-related treatment

Albendazole is useful in treating the infection:

- Albendazole 400mg PO BID for 4 weeks.
- In relapses after treatment should be given a second course of treatment (this may have to be for 6 weeks in resistant cases).
- If the patient relapses after stopping the acute therapy the patient should then be maintained on 400mg once a day, long term.

Metronidazole 400mg PO TID for 10-14 days has also been shown to be useful.

10.3 Isosporiasis

Isosporiasis is caused by the coccidian parasite *Isospora belli*. Infection causes acute, non bloody diarrhoea with crampy abdominal pain, which can last for weeks and result in malabsorption and weight loss. In immunosuppressed patients, and in infants and children, the diarrhoea can be severe. Eosinophilia may be present. The diagnosis is made by the microscopic demonstration of the large, typically shaped oocysts. If stool examinations are negative, examination of duodenal specimens by biopsy or string test may be needed. The oocysts can be visualized on wet mounts by

microscopy with bright-field, contrast microscopy and can also be stained by modified acid-fast stain.

Management

Cotrimoxazole 960mg QDS for 10 days, then BD for 3 weeks, followed by maintenance treatment of 960mg daily.

10.4 Cyclosporiasis

Cyclospora cayetanensis is a unicellular parasite. It is spread by ingesting water or food that is contaminated with infected stool. It is not passed on from one person to the next.

Cyclospora infects the small intestine and causes watery diarrhoea, with frequent, sometimes explosive, bowel movements. Other symptoms can include loss of appetite, substantial loss of weight, bloating, increased gas, stomach cramps, nausea, vomiting, muscle aches, low-grade fever, and fatigue. Some people who are infected with *Cyclospora* may not have any symptoms. Symptoms usually begin 7 days after infection. If not treated, the illness may last from a few days to a month or longer. Symptoms may seem to go away and then return one or more times (relapse).

The diagnosis is made on the finding of cysts of cyclospora in the stools.

Management

Cotrimoxazole given in a dose of 960mg PO QID for 10 days then 960mg OD for 3 weeks is the recommended treatment for infection with *Cyclospora*. Avoiding water or food that may be contaminated with stool may help prevent *Cyclospora* infection. People who have previously been infected with *Cyclospora* can become infected again.

10.5 Giardiasis

Giardiasis is responsible for 2% of chronic diarrhoea in Zimbabwe. The condition is caused by *Giardia intestinalis*, a protozoan flagellate. Acute giardiasis develops after an incubation period of 5 to 6 days and usually lasts 1 to 3 weeks. Symptoms include diarrhoea, abdominal pain, bloating, nausea, and vomiting. In chronic giardiasis the symptoms are recurrent and

malabsorption and debilitation may occur. The clinical spectrum ranges from asymptomatic carriage to severe diarrhoea and malabsorption. Giardiasis is diagnosed by the identification of cysts or trophozoites in the faeces, using direct mounts as well as concentration procedures. Repeated samplings may be necessary. In addition, samples of duodenal fluid or duodenal biopsy may demonstrate trophozoites. Alternate methods for detection include antigen detection tests by enzyme immunoassays, and detection of parasites by immunofluorescence.

Management

Metronidazole is the drug of choice for giardiasis. It is given in a dose of 400mg PO TID for 5 days.

NOTE:

- Cotrimoxazole and metronidazole (a trial of one course of one drug at a time) should be tried in all chronic diarrhoeas realizing they will treat a total of only 4% of diarrhoeas. If cotrimoxazole and metronidazole fail then it should be assumed that the diarrhoea is either *E. bienenusi* (when albendazole may be used) or cryptosporidium and symptomatic treatment is given.

- For symptomatic control a stepwise approach should be used:

Step 1 Loperamide 4mg initially then 2mg with every unformed stool

Step 2 Loperamide and codeine phosphate 30mg PO QID

Step 3 Morphine 5mg PO QID

Step 4 Loperamide and morphine

If loperamide is not available then:

Step 1 Codeine phosphate 30mg PO PRN

Step 2 Codeine phosphate 30mg PO TID

Step 3 Codeine phosphate 30mg PO QID

Step 4 Codeine phosphate 60mg PO QID

Step 5 Morphine starting at 5mg PO every 4 hours

- Antiemetics such as prochlorperazine 10mg PO TID PRN (or 12.5mg TID if given IM), or, metoclopramide 10mg TID PRN (PO/IV/IM), or

cyclizine 50mg TID PRN (PO/IV/IM), or chlorpromazine 25mg every 4 to 6 hours PO/IM, or Promethazine 25mg PO BID can be used.

- Ensure adequate rehydration, potassium replacement (either through oral potassium supplements, or orange crush and bananas), and also adequate nutrition through small nutritious meals taken frequently, i.e., 4 - 6 small palatable meals a day.

10.5 Cerebral toxoplasmosis:

SEE CHAPTER ON CNS MANIFESTATIONS