

Public Health and Primary Health Care
Communicable Disease Control
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Re: Amebiasis Reporting and Case Investigation

Reporting of amebiasis (*Entamoeba histolytica*) is as follows:

Laboratory:

- All positive laboratory results for *E. histolytica* are reportable to the Public Health Surveillance Unit by secure fax (204-948-3044).

Health Care Professional:

- Probable (clinical) cases of amebiasis are reportable to the Public Health Surveillance Unit using the *Clinical Notification of Reportable Diseases and Conditions* form (<http://www.gov.mb.ca/health/publichealth/cdc/protocol/form13.pdf>) ONLY if a positive lab result is not anticipated (e.g., poor or no specimen taken, person has recovered).
- Cooperation in Public Health investigations is appreciated.

Regional Public Health or First Nations Inuit Health Branch (FNIHB):

- Once the case has been referred to Regional Public Health or FNIHB, the *Communicable Disease Control Investigation Form* (www.gov.mb.ca/health/publichealth/cdc/protocol/form2.pdf) should be completed and returned to the Public Health Surveillance Unit by secure fax (204-948-3044).

Sincerely,

“Original Signed By”

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Amebiasis



Public Health Branch

1. Case Definition

1.1 Confirmed Case

At least one of the following:

- Microscopic demonstration of hematophagous trophozoites of *Entamoeba histolytica* in stool or any trophozoites of *Entamoeba histolytica* in tissue (e.g., smear, aspirate, scraping, biopsy).
- Detection of *E. histolytica* DNA by nucleic acid testing (e.g., polymerase chain reaction) (PCR) in an appropriate clinical specimen (e.g., ulcer aspirate/biopsy).
- Illness clinically compatible with extra-intestinal amebiasis (e.g., liver abscess), accompanied by positive serology^a for *E. histolytica* (1).

1.2 Probable Case

- Microscopic demonstration of trophozoites and/or cysts consistent with *Entamoeba histolytica/dispar* in stool in a patient with consistent clinical illness from a contact of a case of confirmed Amebiasis.

2. Reporting Requirements

Laboratory:

- All positive laboratory results are reportable to the Public Health Surveillance Unit (204-948-3044 secure fax).
- Clinical laboratories are required to submit only requested residual specimens from individuals who tested positive for *Entamoeba histolytica* to Cadham Provincial Laboratory (CPL) within seven days of request.

Health Care Professional:

- Cases do not require reporting by health care professional as positive laboratory results will be reported to Manitoba Health by the laboratory.

3. Clinical Presentation/Natural History

Most infections are asymptomatic (2, 3). Clinical syndromes associated with *Entamoeba histolytica* infection include non-invasive intestinal tract infection, intestinal amebiasis (amebic colitis), ameboma, and liver abscess (4). Amebic diarrhea without dysentery (i.e., presence of mucus and blood) is the most common disease manifestation of infection with *E. histolytica* and the mean duration of amebic diarrhea is three days (5). The onset of intestinal amebiasis is often gradual with patients reporting several weeks of symptoms (4, 6). Patients with amoebic colitis present with bloody diarrhea and abdominal pain and tenderness (6). Disease is more severe in those who are malnourished, pregnant women and at the extremes of age (4). Weight loss is common (4, 6), but fever is unusual (6). Symptoms may be chronic and may mimic those of inflammatory bowel disease (4). In young children with amebic dysentery, intussusceptions, perforation and peritonitis or necrotizing colitis may develop rapidly (5). Amebomas occur most commonly in the cecum and can be mistaken for colonic carcinoma (4, 6).

Hematogenous dissemination may occur leading to abscesses of the liver and less commonly of the lung or brain (2). Extra-intestinal disease occurs in a small proportion of patients (4). Amebic liver abscess, the most common extra-intestinal form of invasive amebiasis (6, 7), is much more common in men than in women (5). The host and parasite factors leading to liver infection remain poorly understood (7). Symptoms of amebic liver abscess include fever, cough, and a constant, dull, aching abdominal pain in the upper quadrant or epigastrium (5).

Trophozoites can infect the human liver for several months or years before abscesses are diagnosed (7).

^a Serological tests are unable to distinguish past from current infection as the level of anti-amebic antibodies remains elevated in serum for many years (1).

Ulceration of the skin, usually in the perianal region, occurs rarely by direct extension from intestinal lesions or amebic liver abscesses; penile lesions may occur in men who have sex with men (2). Urinary tract problems have been described in case reports (6).

4. Etiology

Amebiasis is caused by *Entamoeba histolytica*, a protozoan parasite that exists in two forms: the hardy infective cyst and the more fragile, potentially pathogenic trophozoite (2). *E. histolytica* cannot generally be distinguished morphologically from the non-pathogenic *E. dispar* and *E. moshkovskii* (2, 4, 5). However, hematophagous trophozoites (i.e., that have ingested red blood cells within their cytoplasm) are pathognomonic for *E. histolytica*.

5. Epidemiology

5.1 Reservoir

Humans are the only known reservoir. Infections are usually acquired from a chronically ill or asymptomatic cyst passer (2).

5.2 Transmission

Transmission usually follows ingestion of food or water contaminated with human feces (4, 6). Fecal-oral transmission can also occur in the setting of anal sexual practices (8) or direct rectal inoculation through colonic irrigation devices (4). Insects, particularly flies may also act as vectors of cyst-laden feces (9). Amebic cysts are relatively chlorine resistant and can survive in moist environmental conditions for weeks to months (2). Patients with acute amebic dysentery pose only limited danger to others because of the absence of cysts in dysenteric stools and the fragility of trophozoites (2). Persistent cyst passage may result in transmission of *E. histolytica* to household contacts years later (10).

5.3 Occurrence

General: *Entamoeba histolytica* is found worldwide but is more prevalent in people of lower socioeconomic status who live in resource-limited

countries, where the prevalence of amebic infection may be as high as 50% in some communities (4). The actual prevalence of *E. histolytica* infection is poorly described because much of the existing data was collected when investigators could not distinguish *E. histolytica* from *E. dispar* and *E. moshkovskii* (5). Amebiasis is rare below the age of five years (2). Groups at increased risk of infection in industrialized countries include immigrants from or long-term visitors to areas with endemic infection, institutionalized persons and men who have sex with men (4, 11). Invasive liver disease (e.g., liver abscess) is more common in men (8).

Canada: In 2010, 637 cases of *E. histolytica/dispar* were reported to the National Enteric Surveillance Program (NESP) (12). Of the cases reported, 29 were identified as being travel-associated (12). *Entamoeba histolytica/dispar* infections are not routinely reported to the provincial or central reference laboratories and are greatly under-represented in NESP (12).

Manitoba: In 2011, 30 cases of amebiasis were reported to Manitoba Health. For 2000-2011 inclusive, 422 cases were reported with the annual incidence varying from 1.8 to 4.3 per 100,000 population. For 2000-2011, more cases were reported in males; 266 compared to 156 in females, and the highest number of cases (214) were reported in the 20-44 year age group.

Note: These data should be interpreted with caution. Microscopic observation of stool specimens to detect cysts/trophozoites was the diagnostic method used to identify over 95% of amebiasis cases reported to Manitoba Health. Microscopy cannot generally differentiate *E. histolytica* from non-pathogenic *Entamoeba dispar* or *E. moshkovskii* species. It is possible that some cases had non-pathogenic *Entamoeba* species present (e.g., *E. dispar*) but the gastrointestinal symptoms were from another etiology.

5.4 Incubation Period

Incubation is usually 14 to 28 days, but ranges from a few days to months or years (2, 4).

5.5 Susceptibility and Resistance

Susceptibility to infection is general; those harbouring *E. dispar* do not develop disease (2). Re-infection is rare (2, 11). Individuals at increased risk of severe amebiasis, include very young or old persons, malnourished persons, pregnant women, and patients receiving corticosteroids (5).

5.6 Period of Communicability

Infected patients excrete cysts intermittently, sometimes for years if untreated (4).

6. Diagnosis

Diagnosis is made by microscopic demonstration of trophozoites and/or cysts in SAF-preserved fecal specimens, and also smears, aspirates or scrapings obtained by endoscopy/proctoscopy, aspirates of extra-intestinal abscesses or tissue biopsies (for PCR only). The presence of hematophagous trophozoites (containing red blood cells or their remnants) indicates invasive amebiasis caused by *E. histolytica*, and is the only microscopic observation that distinguishes *E. histolytica* from *E. dispar* or *E. moshkovskii*.

Serological testing (through reference laboratory) is an important or may be the sole diagnostic test for extra-intestinal amebiasis, such as amebic liver abscess, where stool examination is often negative. The sensitivity is approximately 70%. Since *E. dispar* is not pathogenic/invasive, the presence of antibody usually indicates *E. histolytica* infection. The presence of antigen in extra-intestinal sites indicates invasive *E. histolytica* infection. Detection of *E. histolytica* DNA by PCR at a reference laboratory in extra-intestinal sites (e.g., liver aspirate) indicates invasive *E. histolytica* infection.

Ultrasonography and CAT (computerized axial tomography) scanning are helpful in identifying the presence and location of an amebic liver abscess, and can be considered diagnostic when associated with a specific antibody response to *E. histolytica* (2).

7. Key Investigations for Public Health Response

- History of international travel (especially to areas with inadequate water/sewage) or to recreational/rural areas within Manitoba/Canada.
- History of inadequate water supply, sewage disposal, or hygiene.
- History of institutionalization (e.g., mentally disabled).
- Sexual history (especially oral-anal contact), particularly in the absence of recent travel.

8. Control

8.1 Case Management

Treatment:

- Asymptomatic carriers (cyst excretors) should be treated with a luminal amebicide (e.g., iodoquinol, paromomycin, diloxanide) (4) to protect the patient from development of invasive disease and to reduce the risk of transmission to others (2, 6). Metronidazole is not effective against cysts (4).
- Patients with mild to moderate or severe intestinal tract symptoms or extra-intestinal disease (including liver abscess) should be treated with metronidazole or tinidazole^b (4, 13), followed by a therapeutic course of a luminal amebicide (iodoquinol or paromomycin) (4). Metronidazole and paromomycin should not be given at the same time because diarrhea is a common side effect of paromomycin and may impair assessment of the patient's response to therapy (5, 14).
- Metronidazole is generally contraindicated in the first trimester of pregnancy (2). Consultation with an infectious diseases specialist is recommended for treatment of pregnant women.

^b Tinidazole is currently only available through Health Canada's Special Access Program (SAP) (<http://www.hc-sc.gc.ca/dhp-mps/acces/drugs-drogués/index-eng.php>).

- Percutaneous or surgical aspiration of large liver abscesses is rarely required when response of the abscess to medical therapy is unsatisfactory (4). Consultation with an infectious diseases specialist is recommended.

Public Health/Infection Control Measures:

- Contact precautions are indicated for pediatric patients who are incontinent or unable to comply with hygiene and should be considered for incontinent adults if stool cannot be contained or for adults with poor hygiene who contaminate their environment. Otherwise, Routine Practices are adequate. Refer to the Manitoba Health document *Routine Practices and Additional Precautions: Preventing the Transmission of Infection in Health Care* available at: <http://www.gov.mb.ca/health/publichealth/cdc/docs/ipc/rpap.pdf>).
- Symptomatic cases should be excluded from food handling and from direct care of hospitalized and institutionalized patients until completion of antimicrobial therapy (2).
- Patients must be advised of the importance and effectiveness of washing hands with soap and water after defecation and before preparing, serving or eating food (2).
- Because of the risk of shedding infectious cysts, people diagnosed with amebiasis should be counselled to refrain from using recreational water venues (e.g., swimming pools, water parks) until after their course of luminal therapy has been completed and any diarrhea they might have been experiencing has stopped (4).
- Patients with amebiasis should be counselled on avoiding sexual practices that may permit fecal-oral transmission (4, 8).

8.2 Contact Management

Contacts include household members as well as non-household members where there is close ongoing contact (e.g., sexual partner).

- Chemoprophylaxis of contacts is not indicated (2, 15).

- Contacts should have adequate stool examinations performed and be treated only if results are positive (4, 10) as per *Case Management* above.
- Symptomatic contacts should be assessed by a physician.
- Contacts should be educated on transmission and preventive measures (refer to Section 8.4).

8.3 Outbreak Management

An outbreak is defined as the occurrence of case(s) in a particular area and period of time in excess of the expected number of cases.

- Antimicrobial prophylaxis is not recommended for amebiasis outbreak management.
- Outbreaks should be investigated to identify a common source of infection and prevent further exposure to that source. The extent of the investigation will depend upon the number of cases, the likely source of contamination and other factors.
- Refer to the *Enteric Illness Protocol* available at: www.gov.mb.ca/health/publichealth/cdc/protocol/enteric.pdf
- Public notification should occur. The level of notification will usually be at the discretion of regional Public Health and/or the provincial Public Health Branch for local outbreaks but may be at the discretion of the Federal Government for nationally linked foodborne outbreaks as per *Canada's Foodborne Illness Outbreak Response Protocol (FIORP) 2010: To guide a multi-jurisdictional response* available at: www.phac-aspc.gc.ca/zoono/fiorp-pritioa/index-eng.php
- Education on preventive measures should occur (refer to Section 8.4 below).

8.4 Preventive Measures

- Protection of public water supplies from fecal contamination. Sand filtration of water removes nearly all cysts and diatomaceous earth filters remove them completely. Chlorination of water generally practiced in municipal water treatment does not always kill cysts (2).

- Small quantities of water (e.g., canteens) are best treated with prescribed concentrations of iodine, either as liquid or water purification tablets. A contact period of at least 10 minutes (30 minutes if cold) should be allowed to elapse before drinking the water (2). Portable filters with less than 1.0 micron pore size are also effective (2). Water of undetermined quality can be made safe by boiling for one minute (at least 10 minutes at high altitudes) (2).
- Inspection for cleanliness and supervision of the sanitary practices of individuals preparing and serving food in public eating places.
- Disinfectant dips for fruits and vegetables are of unproven value in preventing transmission of *E. histolytica*. Thorough washing with potable water and keeping fruits and vegetables dry may help; cysts are killed by desiccation, by temperatures above 50°C (122°F), and by irradiation (2).
- Abstinence from using untreated human and animal manure in farming (16).
- Education of the public on the need to wash hands after defecation and before preparing, serving or eating food (2, 16).
- Treatment of known carriers (2).
- Exclusion of symptomatic cases from food handling and from direct care of hospitalized and institutionalized patients (2).
- Individuals diagnosed with amebiasis refraining from using recreational water venues (e.g., swimming pools, water parks) until after their course of luminal therapy has been completed and any diarrhea they might have been experiencing has stopped (4).
- Controlling sexual transmission by use of condoms and avoidance of sexual practices that may permit fecal-oral transmission (4).

References

1. Fotedar R, Stark D, Beebe N *et al.* Laboratory Diagnostic Techniques for *Entamoeba* Species. *Clin. Microbiol. Rev.* 2007; 20 (3): 511-532.
2. Heymann David L. Amebiasis. In: *Control of Communicable Diseases Manual 19th ed*, American Public Health Association, Washington, 2008; 11-15.
3. Blessmann J, Ali IKM, Ton Nu PA, Dinh BT *et al.* Longitudinal Study of Intestinal *Entamoeba histolytica* Infections in Asymptomatic Adult Carriers. *J. Clin. Microbiol.* 2003; 41 (10): 4745-4750.
4. American Academy of Pediatrics. Amebiasis. In: Pickering LK ed. *Redbook 2012 Report of the Committee on Infectious Diseases 29th ed.* Elk Grove Village, IL: American Academy of Pediatrics, 2012; 222-225.
5. Petri Jr. WA and Haque R. *Entamoeba* Species, Including Amebiasis. In: Mandell GL, Bennett JE, Dolin R eds. *Principles and Practice of Infectious Diseases 7th ed.* Elsevier, Philadelphia, 2010.
6. Stanley Jr. SL. Amoebiasis. *Lancet* 2003; 361:1025-34.
7. Santi-Rocca J, Rigother MC and Guillén N. Host-Microbe Interactions and Defense Mechanisms in the Development of Amoebic Liver Abscesses. *Clin. Microbiol. Rev.* 2009; 22(1): 65-75.
8. Salit IE, Khairnar K, Gough K and Pillai DR. A Possible Cluster of Sexually Transmitted *Entamoeba histolytica*: Genetic Analysis of a Highly Virulent Strain. *Clinical Infectious Diseases* 2009; 49: 346-53.
9. Graczyk TK, Knight R and Tamang L. Mechanical Transmission of Human Protozoan Parasites by Insects. *Clin. Microbiol. Rev.* 2005; 18(1): 128-132.
10. Vreden SGS, Visser LG, Verweij JJ *et al.* Outbreak of Amebiasis in a Family in The Netherlands. *Clinical Infectious Diseases* 2000; 31: 1101-4.

11. Haque R, Mondal D, Duggal P *et al.* *Entamoeba histolytica* Infection in Children and Protection from Subsequent Amebiasis. *Infection and Immunity* 2006; 74(2): 904-909.
12. Public Health Agency of Canada. National Enteric Surveillance Program (NESP) Annual Summary 2010.
13. Gonzales MLM, Dans LF and Martinez EG. Antiamoebic drugs for treating amoebic colitis (Review). The Cochrane Library 2009; Issue 2, *The Cochrane Collaboration*. Available at: <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD006085.pub2/pdf>
14. Haque R, Huston CD, Hughes M, Houpt E and Petri Jr. WA. Amebiasis. *N Engl J Med* 2003; 348(16): 1565-1573.
15. World Health Organization. Amoebiasis. *Weekly Epidemiological Record* 1997; 72: 97-100.
16. Fletcher SM, Stark D, Harkness J and Ellis J. Enteric Protozoa in the Developed World: a Public Health Perspective. *Clinical Microbiology Reviews* 2012; 25(3): 420-449.