Challenge PA1804-2

April 2018

Stool: No ova or parasites seen /*Blastocystis* species, leukocytes

CMPT QA/QC/ Statistics

This sample was verified by two reference laboratories. The sample preview showed few *Blastocystis* species. CMPT decided to send the sample to learn how many laboratories would report their presence.

All challenge components are confirmed before shipping by the reference laboratories. No further statistical analysis is performed on the results beyond that described under "Suitability

SURVEY RESULTS

Reference laboratories: both reference laboratories reported the presence of *Blastocystis* species and leukocytes.

Participants (Table 1):

4/18 (22%) laboratories reported *Blastocystis* species, leukocytes/WBC

9/18 laboratories reported no ova or parasites (50%);

2/18 (11%) laboratories reported no ova or parasites, leukocytes

4/18 (22%) laboratories reported *Blastocystis* species

Suitability for Grading

A challenge component is considered suitable for grading if agreement is reached by both (100%) reference laboratories and at least 70 percent of the participants.

Although *Blastocystis* species was observed by both reference laboratories participants' consensus (70 percent) was not achieved thus this challenge was considered **not suitable for grading**.

COMMENTS ON RESULTS

Both samples PA1804-2 and PA1804-3 had *Blastocystis* species in it. The concentration in sample 2 was lower than that of sample 3. The results reported by the laboratories reflected this difference. While most laboratories reported *Blastocystis* species for sample 3, half of laboratories did not for sample 2.

This is probably because of the low concentration of the organism in sample 2 and also because some laboratories do not report the presence of this parasite when the numbers are low.

It is important however to note their presence and laboratories that did not see *Blastocystis* in their slides should have another look at them to make sure they can see leukocytes and *Blastocystis*.

Grading

Because no consensus was reached among the participant laboratories, this challenge was not suitable for grading.

Table 1. Results reported

Reported	Labs	Grade
No ova or parasites	9	ungraded
No ova or parasites, Leukocytes	2	ungraded
Blastocystis species	3	ungraded
Blastocystis species, Leukocytes/WBC	4	ungraded
Total	18	

The identification and clinical significance of *Blastocystis* species has been reviewed in critique PA1804-3. This critique will focus on the significance of the presence of leukocytes in stools.

CLINICAL RELEVANCE

The presence of white blood cells (WBCs) in feces reflects an inflammatory or invasive process in the colon or distal small bowel. [1,2]

Large numbers of neutrophils are most frequently found in patients with bacterial dysentery, amebiasis, pseudomembranous enterocolitis, and ulcerative colitis.

The most common agents of bacterial dysentery are *Shigella, enterohemorragic Escherichia coli* (EHEC), *Salmonella enteritidis*, *Vibrio parahaemolyticus*, *Clostridium difficile*, and *Campylobacter jejuni*. [3]

Although of an invasive nature, amebic colitis might not present with abundant neutrophils in feces because of the cytopathic effect of virulent amebae on mammalian cells and when present, the neutrophils are usually pyknotic. [4]

Neutrophils are also frequently present in patients with nonspecific inflammatory bowel disease (ulcerative colitis). Therapy for this condition often includes immunosupressive agents which would be contraindicated in patients with amebiasis. [4]

On the other hand, neutrophils may cause problems with identification of parasites and can be confused with cysts or trophozoites of *Entamoeba histolytica/dispar*. Neutrophils are smaller than *E. histolytica/dispar* cysts (14µm vs 20µm average size), they have a smaller nucleus/cytoplasm ratio (1:1 vs 1:10-trophozoite, 1:2 – cyst), the shape of the nucleus is different (2-4 segments vs. round with central karyosome), and their cytoplasm is granular vs. a uniform, agranular cytoplasm for *E. histolytica/dispar*. [4]

Garcia[4] recommends that host cells (neutrophils, red blood cells, macrophages, yeasts) be reported and quantitated (rare, few, moderate, many).

Mononuclear leukocytes may be found in the stools of patients infected with organisms that penetrate through the intestinal mucosa and multiply in the lymphatic or reticuloendothelial cells (*S. typhi, Yersinia, C. jejuni*) when diarrhea is present. [3]

REFERENCES

1. Guerrant RL, Van Gilder T, Steiner TS, et al. Practice guidelines for the management of infectious diarrhea. Clinical Infectious Diseases. 2001;32:331-351.

2. Thielman NM, Guerrant RL. Acute infectious diarrhea. N Engl J Med. 2004;350:38-47.

3. Guerrant R, Steiner TS. Gastrointestinal infections and food poisoning. In: Mandell D, Ben-nett, ed. Vol 1. 6th ed. Philadelphia; Churchill Livingstone: Elsevier; 2005:1215.

4. Garcia L.S. Artifacts that can be confused with parasitic organisms. In: Diagnostic Medical Parasitology. 5th ed. Washington, DC: ASM; 2007:947.

5. Clinical Laboratory Standards Institute. Procedures for the recovery and identification of parasites from the intestinal tract; approved guideline- second edition. Wayne, PA.: CLSI; 2005;25:M28-A2