

Clinical Importance of Adequately Performed Stool Ova and Parasite Examinations

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(See the article by Branda et al. on pages 972–8)

Branda et al. [1] should be commended for their efforts to control costs and save resources by critical examination of the policies for stool ova and parasite examination. They question the conventional wisdom, which requires that multiple specimens be tested, and conclude that, in most instances, only 1 examination is needed. However, clinicians and laboratorians should also critically review the design and results of their study to determine whether their conclusions are justified by the data that they present. I have reason to suspect that, in many situations, such a limited practice would result in underdiagnosis of parasitic infections and possibly compromise patient care.

First of all, there are a number of questions concerning their methods. Although sodium acetate–acetic acid–formalin is a legitimate stool preservative, it is uncommonly used by laboratories in the United States. It is recommended that albumin-coated slides be used with sodium acetate–acetic acid–formalin to ensure that the specimen sticks to the slides, but there is no mention of such use here. When so-

dium acetate–acetic acid–formalin is used, iron hematoxylin is the recommended permanent stain [2, 3]. The authors use of chlorazol black E stain is distinctly unusual. This may result in morphologic characteristics quite different than those obtained with the more widely used trichrome or iron hematoxylin stains. Although their laboratory may have extensive experience with these procedures, it is possible that the numbers and types of parasites they identified could be somewhat different than those identified by others using more conventional methods.

Their reporting of specimens containing only “nonpathogenic” parasites as “negative” is questionable. Identification of these parasites has value in demonstrating that the laboratory can readily detect and differentiate them from morphologically similar pathogens. This requires considerable skill and experience, especially with intestinal protozoa. The proficiency testing surveys of the College of American Pathologists require identification of *all* parasites present. Moreover, specimens containing nonpathogenic parasites are not truly negative. Some parasitologists consider the presence of nonpathogenic parasites to indicate exposure to contaminated food or water, which suggests the need to search further for undetected pathogens. Admittedly, data supporting this idea are not available.

Branda et al. [1] state that similar de-

tection rates of parasites in the first stool specimen (91%) before and after implementation of their “1 stool examination” policy provides evidence that 1 examination is sufficient. This conclusion is hard to accept, because in both time periods, only 1 stool specimen was examined in the great majority of cases. Of course most parasites will be detected in the first examination if only 1 examination is performed! The authors do state that the overall positivity rate jumped from 11.9% when only 1 specimen was submitted to 17% for a 3-specimen series. In fact, the most valuable information is contained in the authors’ second table [1], which shows test results when 3 specimens were examined for each patient. Only 72% of parasites were detected in the first specimen; 28% would have been missed if only 1 specimen had been examined! This is not very different from what has been shown in other studies [4]. Moreover, some organisms, such as *Strongyloides* species, can require >3 exams as well as special procedures (Baermann technique and agar plate culture) to ensure their adequate detection. The authors’ results raise the possibility that not all cases of strongyloidiasis were detected. Lack of recognition of this parasite could have dire consequences, especially in immunocompromised patients.

The authors recognize that additional parasites may be detected in multiple specimens beyond those found in a first spec-

Received 8 December 2005; accepted 12 December 2005; electronically published 27 February 2006.

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Clinical Infectious Diseases 2006;42:979–80

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1058-4838/2006/4207-0014\$15.00

imen. However, they state that, “the extra specimens fail to provide additional useful information in 90% of cases” [1, p. 976] without detailing exactly how they reached that conclusion. They do provide information for 15 such cases in their third table [1] (recall that this excludes specimens containing nonpathogenic parasites) and suggest that because, in most instances, the treatment for the first organism detected would adequately treat subsequently detected parasites, there really is no need to know about the latter. I disagree. Clinically and epidemiologically, it is always useful to have complete microbiologic information. In addition, there are a number of instances in the authors’ study when the drug of choice for the first parasite detected (e.g., *Ascaris lumbricoides*) would be inappropriate for the additional parasite (such as *Giardia* species) or when an agent selected for 1 protozoa would not be the same as that selected for another for a variety of clinical reasons. The choice should be made by the physician caring for the patient, not by the laboratory.

The authors’ emphasis on prevalence rates is also troublesome. Prevalence figures are most appropriate when dealing with homogeneous populations and may not be useful to laboratories that receive specimens from diverse patient groups, including travelers, expatriates, refugees, and immigrants from areas of endemicity for

various parasitic infections. The laboratory will rarely receive enough information to categorize individual patients and place them in high- or low-prevalence groups. The sensitivity of 72% found by Branda et al. [1] for 1 specimen may be acceptable for patients in the low-prevalence group but certainly not for those in the high-prevalence group. The latter would depend on the idealized, detailed, communication required between physicians and the laboratory to ensure that additional examinations of specimens were performed when indicated (the authors’ first figure [1]). However, this is often impractical in large, complex centers with busy, diverse, and ever-rotating staff. The problem is even greater with referral laboratories that receive specimens from multiple, widely dispersed, outside institutions. Miscommunication will likely result in passive acceptance of a single negative result or in delayed recognition that only 1 specimen was actually examined.

Although a single-examination policy may realize measurable savings, it is more difficult to quantitate the cost in dollars and morbidity (or even mortality) of delayed or inadequate diagnoses due to limited laboratory examinations. If testing is worth doing it is worth doing well. We should strive to educate clinicians about the added value of submitting multiple specimens, when appropriate, so that more than the 28% cited here and by

Branda et al. [1] would do so. We would not institute the “1 stool examination” policy in our own institution, because I do not believe that a single negative finding (or a specimen containing only nonpathogenic parasites) is adequate to rule out infection in a diverse patient population. Perhaps a more reasonable, cost-effective approach would be to limit testing of subsequent specimens after a first *positive* result is found. The laboratory report could indicate that further specimens would be examined only after a specific request and that such examinations do sometimes reveal additional parasites, especially in patients from areas of endemicity.

Acknowledgments

Potential conflicts of interest. J.E.R.: no conflicts.

References

1. Branda JA, Tai-Yuan DL, Rosenberg ES, Halpern EF, Ferraro MJ. A rational approach to the stool ova and parasite examination. *Clin Infect Dis* **2006**;42:972–8 (in this issue).
2. Garcia LS, ed. *Diagnostic medical parasitology*. 4th ed. Washington DC: ASM Press, **2001**.
3. Clinical and Laboratory Standards Institute (NCCLS). Procedures for the recovery and identification of parasites from the intestinal tract: approved guideline. NCCLS document M28-A. Wayne, PA: NCCLS, **1997**.
4. Thomson RB, Haas RA, Thompson JH. Intestinal parasites: the necessity of examining multiple stool specimens. *Mayo Clin Proc* **1984**;59:641–642.