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Screening for *Escherichia coli* O157:H7—a Nationwide Survey of Clinical Laboratories

Boyce et al. report the results of a nationwide survey of clinical laboratories to determine the proportion of laboratories that routinely screen all stools or all bloody stools for *Escherichia coli* O157:H7 (1). According to their results, 29% of laboratories screen all stools, 53% screen stools selectively, and 27% do not screen at all for this organism. We began screening stools for *E. coli* O157 in June 1993. Initially, stools were screened only when specifically requested by a physician. We extended our screening policies to include routine selective screening in January 1994 and to include screening of all stools in June 1994. Despite this aggressive screening policy, we have not isolated *E. coli* O157 from any patient specimens, and we are reevaluating our current policy.

Our laboratories, located at the Roosevelt Hospital site at 59th Street and 10th Avenue and at the St. Luke's site at 114th Street and Amsterdam Avenue in New York City, process an average of 2,500 stool cultures per year. Relevant characteristics of the patients from whom these specimens were submitted during the past year are as follows: outpatients, 40%; male, 60%; age of >50 years, 29%; age 12 to 50 years, 42%; age 6 months to 12 years, 15%; age of <6 months, 14%. A diagnosis of AIDS or human immunodeficiency virus infection was indicated for 24% of the patients. Screening for *E. coli* O157 was specifically requested by the physician only rarely (0.5%), but evaluation for bloody diarrhea was specified for 5%. Evaluation for gastroenteritis or infectious diarrhea was specified for an additional 16%. For the remaining specimens, diagnostic information supplied was as follows: fever and diarrhea, 14%; fever, 16%; diarrhea, 17%; vomiting or other gastrointestinal complaints, 21%. Only 3% of specimens were submitted without any diagnostic information.

In January 1994 we began routine MacConkey-sorbitol screening (MacConkey II agar with sorbitol; BBL, Cockeysville, Md.) for all bloody stools, for all stools during investigation of a potential outbreak, and of any stool specimen at the request of the treating physician. Per our protocol, MacConkey-sorbitol plates are incubated at 37°C and read within 18 to 24 h. Sorbitol-negative isolates identified as *E. coli* (API 20E; bioMerieux Vitek, Hazelwood, Mo.) are then tested by using latex agglutination (*E. coli* Latex Reagent Kit; ProLab Diagnostics, Round Rock, Tex.) for the O157 antigen. Strict quality control procedures are followed for media and reagents, using *E. coli* ATCC 35150 (sorbitol negative, agglutination positive) and *E. coli* ATCC 25922 (sorbitol positive, agglutination negative). MacConkey-sorbitol agar is tested when a new batch is received and then weekly; latex reagents are tested when a new kit is received and each day of use. We identify sorbitol-negative isolates biochemically before latex testing, as we have found that other sorbitol-negative, gram-negative organisms, including *Alcaligenes faecalis* and *Morganella morganii*, may nonspecifically agglutinate the *E. coli* O157 latex reagent.

During the period January to June 1994, we detected no *E. coli* O157 isolates. In June 1994, following reports of outbreaks of *E. coli* O157:H7 in the northeastern as well as western United States (2–4), we began to screen all stools submitted to our laboratory for culture. From June 1994 through November 1995, we screened a total of 3,350 stools, 1,169 in 1994 and 2,181 in 1995. We have detected no isolates of *E. coli* O157 from any patient specimens, suggesting that infection and colonization with this organism occur at a very low rate in our area. We were surprised by this finding, as our Hospital Center, located at two sites on the West Side of Manhattan, serves a population with very diverse ethnic and socioeconomic backgrounds. Of note, our laboratory detected 81 cases of infection with *Salmonella* species, 32 cases with *Shigella* species, 53 cases with *Campylobacter* species, 1 case with *Yersinia* species, and one case of infection with *Vibrio cholera* (non-O1, non-O139) during the same period (July 1994 through November 1995).

Improper procedures are unlikely to account for the low isolation rate we have observed. A detailed review of a sample of 233 stool workups from this period indicated that all procedures for screening and evaluation of isolates had been followed. Additionally, the clinical laboratories at both of our sites have successfully detected *E. coli* O157 in proficiency test samples.

Boyce et al. present data from Washington State estimating a cost of $1.10 per culture to screen each stool sample for *E. coli* O157:H7. Assuming this figure is correct, we have spent $3,685 without detecting any cases. Boyce et al. have recommended screening all stools submitted for culture for *E. coli* O157:H7. From our experience, we feel that a selective policy for screening of stools for this organism would be more cost-effective. We agree with Boyce et al. that laboratories should determine the local isolation rate for this organsism. These results would seem to be the most appropriate basis for determining individual laboratory policy regarding universal versus selective screening.

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Authors' Reply

We appreciate the letter by Sordillo and Nusbaum, which describes their experience culturing patients' stools for *E. coli* O157:H7 over an 18-month period in their laboratories. Despite using appropriate techniques, they failed to isolate *E. coli* O157:H7 from any of 3,350 stool specimens. This contrasts with the results of a multicenter study conducted at 10 hospital laboratories in the United States from 1990 to 1992. Overall, *E. coli* O157:H7 was cultured from 0.38% of stools submitted for culture; among specimens with visible blood, *E. coli* O157:H7 was isolated more frequently (7.8%) than any other pathogen (2). However, the isolation rates varied among the different sites (3).

We encourage other laboratories to determine the local

isolation rate for *E. coli* O157:H7, as Sordillo and Nusbaum have done. For their two laboratories, screening all stools submitted for culture for *E. coli* O157:H7 does not appear to be cost-effective at this time. However, to identify *E. coli* O157:H7 infection in the subgroup most likely to have it, we recommend that they continue to screen all grossly bloody stools for the organism, as well as stools from patients who report having had bloody diarrhea. Screening all bloody stools would still enable the early detection of an outbreak which by preventing additional cases would prove to be a cost-effective laboratory practice (1). If isolation rates for *E. coli* O157:H7 from persons with bloody diarrhea increase, the authors should reconsider their policy, perhaps culturing all stools for *E. coli* O157:H7 during the summer months.

The question remains as to the etiology of bloody diarrhea in the population served by Sordillo and Nusbaum. If a large percentage of bloody stools tested in their laboratories yield no bacterial pathogen, the authors may consider conducting a study to look for other Shiga toxin-producing *E. coli* strains. It would be interesting to know the incidence of hemolytic-uremic syndrome in their area, as this disease is a sentinel for infection with *E. coli* O157:H7 and other Shiga toxin-producing *E. coli* strains. Making hemolyic-uremic syndrome a reportable disease nationally would contribute to our understanding of the regional variations in the incidence of these emerging infections.

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