JOURNAL OF CLINICAL MICROBIOLOGY, Oct. 1999, p. 3369 Vol. 37, No. 10
0095-1137/99/$04.00+0

Cost-Effective Methods for Isolation of *Salmonella enterica* in the Clinical Laboratory

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Received 17 March 1999/Returned for modification 22 May 1999/Accepted 27 June 1999

Data from 8,717 fecal specimens indicate that primary inoculation of xylose lysine deoxycholate (XLD) agar may enhance the speed, but not the sensitivity, of isolation of *Salmonella enterica* over that achieved with Selenite enrichment only. Plating of Selenite broth onto both brilliant green and XLD agar offers no advantage over plating onto XLD alone.

Salmonella enterica is an important human pathogen. *S. enterica* serotype Typhimurium and *S. enterica* serotype Enteritidis are the most common serotypes in Europe and North America at present. In most laboratories where stool samples are cultured for *S. enterica*, both solid medium and an enteric enrichment broth such as Selenite are inoculated directly with the specimen. It has been suggested that enrichment broth be used only during outbreaks, for screening for asymptomatic carriage, and in other clinically warranted situations (3, 4). We have conducted a study on stool specimens submitted to the Microbiology Laboratory in University College Hospital, Galway, Ireland, over a one-year period (July 1996 to June 1997) to determine if inoculation of both enrichment broth and a primary xylose lysine deoxycholate (XLD) agar plate (Oxoid) is of value. Over a separate 3-month period, we evaluated the need for plating of the Selenite enrichment broth cultures onto both XLD and brilliant green agar.

Between July 1996 and June 1997, 8,717 stool specimens were submitted to the laboratory for culture. Specimens were inoculated directly into XLD agar and into Selenite enrichment broth (Difco). Twelve to eighteen hours later, the Selenite culture was subcultured onto XLD and brilliant green agar plates. Colonies morphologically resembling *S. enterica* were confirmed as *S. enterica* by API20E (Biomerieux), and the serotype was established by slide agglutination with standard antisera (Murex). *S. enterica* was identified in 312 (3.6%) stool specimens. Of these, 115 specimens (37% of all isolates) were from newly identified cases, while 197 (63%) were repeat specimens from previously diagnosed cases. In all 68 cases where *S. enterica* was isolated on the primary XLD plate, it was also isolated from enrichment broth. However, 47 (41%) of the 115 new *S. enterica* isolates did not grow on the primary XLD plate but grew only after Selenite enrichment.

Over a 3-month period, data were collected prospectively for 2,602 stool specimens initially enriched in Selenite and subcultured onto both XLD and brilliant green agar plates. *S. enterica* was recovered from 76 enrichment cultures on XLD plates (2.9%) but from only 70 of the brilliant green agar plates. No isolates were isolated on brilliant green agar only.

Our data are similar to those recently reported by Forward and Rainnie (2) and support their view that Selenite enrichment broth should be used on all specimens to maximize the sensitivity of culture for *S. enterica*. However, 68 (59%) of our 115 newly identified cases were detectable on the primary XLD plate. Forward and Rainnie suggest inoculation of only one medium, Selenite enrichment broth, on day 1 (2). We do not support that recommendation, because inoculation of XLD plates on day 1 enabled detection of *S. enterica* in 59% of cases 1 day earlier than would have been possible if only the Selenite enrichment broth had been inoculated on day 1. Early recognition of infection is important in order to expedite public health intervention to minimize further transmission, particularly in an outbreak situation. Primary XLD plates probably need not be used, however, on repeat specimens, specimens submitted for preemployment screening, or other nonurgent specimens. It has been suggested that plating of Selenite enrichment broth onto brilliant green agar in addition to XLD may be advantageous (1); however, our data do not support the value of this practice. Our results are consistent with the view that brilliant green agar is more inhibitory than XLD. This study provides a basis for the modification of procedures for isolation of *S. enterica*. We estimate that such modifications can result in savings in materials equivalent to $2,250 to $3,000 per year in our laboratory, in addition to labor savings, without loss of sensitivity.

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