JOURNAL OF CLINICAL MICROBIOLOGY, Feb. 1989, p. 341–342
0095-1137/89/020341-02$02.00/0

Vol. 27, No. 2

Identification of *Campylobacter pylori* by Using the RapID NH System

ANDREA L. SWIATLO,[1] BASHAR ATTAR,[2] HULYA LEVENDOGLU,[2] BENJAMIN GO,[2] AND FRANK E. KOCKA[1]*

Division of Microbiology[1] and Division of Gastroenterology,[2] Cook County Hospital-Hektoen Institute for Medical Research, Chicago, Illinois 60612

Received 8 September 1988/Accepted 21 October 1988

***Campylobacter pylori* has been associated with chronic active antral gastritis. The organism was isolated from 19 of 45 gastric mucosal biopsies on blood agar plates with increased CO_2 at 35°C. The RapID NH system, a set of dehydrated substrates for preformed enzymes, was used to assist in the identification of *C. pylori*. All *C. pylori* gave the same biochemical profile, and it was different from those of all other organisms in the profile index of the manufacturer. The RapID NH system is useful in the identification of *C. pylori*.**

Campylobacter pylori has been reported as the causative agent in chronic active antral gastritis (1). Methods for culture of this organism as well as basic identification tests have been developed (2, 3). Recently, McNulty and Dent (2) defined a group of rapid biochemical tests to identify *C. pylori*. These rapid tests are often difficult to obtain and perform individually; however, the RapID NH system, designed to identify *Neisseria* spp., *Haemophilus* spp., and other fastidious organisms, includes several of the commercially available tests on one dehydrated panel. We used this system in conjunction with the basic identification scheme to determine if the system could be used to assist technologists in the identification of *C. pylori*.

The RapID NH system is a qualitative micromethod employing both conventional and chromogenic substrates for the identification of various fastidious gram-negative bacteria. The procedure takes approximately 4 h to perform with a heavy inoculum. The RapID-ANA is a similar system for the identification of anaerobes. Both systems were developed by Innovative Diagnostics Inc. and marketed by Vitek Systems, Inc., St. Louis, Mo.

Gastric mucosal biopsies were submitted to the Cook County Hospital Microbiology Laboratory in Port-a-Cult tubes (BBL Microbiology Systems, Cockeysville, Md.). The tissue was removed from the tube and crushed with sterile applicator sticks in a sterile petri dish. This material was then plated on Trypticase (BBL) agar, tested for catalase, oxidase, and urease, and stained with Gram stain. Except for two cases, all the positive specimens were essentially pure cultures of small colonies. Small colonies that were urease, catalase, and oxidase positive and were curved gram-negative rods were considered *C. pylori*. These organisms were directly used as inoculum for the RapID NH or RapID-ANA system. Because preformed enzymes were needed for all reactions on the system, a heavy inoculum was necessary. If there was not enough growth on the primary plate to give a heavy inoculum, a subculture was made onto a fresh blood agar plate which was incubated at 35°C for 3 days in 5 to 12% CO_2. This culture was harvested and used as inoculum for the test panels. The RapID NH and RapID-ANA systems were used in accordance with the instructions of the manufacturer.

Of 45 biopsy cultures, 19 were positive for *C. pylori* by conventional methods. These isolates all showed the same biochemical pattern on the RapID NH system: positive for urease, ornithine decarboxylase, and gamma-glutamyl aminopeptidase and negative for phosphatase, nitrate, σ-nitrophenyl-β-D-galactopyranoside, prolyl-aminopeptidase, resazurin, glucose, sucrose, esterase, nitrate, and indole. The RapID-ANA showed only two positive tests: phosphatase and arginine aminopeptidase. All isolates also had the same biochemical pattern on this panel. The test information fit the data on preformed-enzyme rapid tests previously reported (2, 3), with the exception of the ornithine decarboxylase and phosphatase tests. There is no information concerning the ornithine decarboxylase test (2, 3). Megraud et al. (3) reported an acid and an alkaline phosphatase in all isolates; however, McNulty and Dent (2) reported only on the presence of alkaline phosphatase in their isolates. The RapID NH and RapID-ANA used different substrates and pHs for the phosphatase. The RapID NH used *p*-nitrophenyl phenyl phosphonate (pH 6.2), and the RapID-ANA used *p*-nitrophenyl phosphate (pH 4.7). Apparently, the substrate for phosphatase on the RapID NH panel does not detect the presence of the *C. pylori* phosphatase, but the result was uniform among all isolates and can be considered a negative reaction when this system is used.

In general, both systems were useful additions to the screening test for the identification of *C. pylori*; however, the RapID NH system had considerably more reactions per panel. Only one biochemical profile was found with each system, and no other organism matched this profile in the index of the manufacturer. The list price for one RapID NH panel (12 tests) is approximately $2.00, compared with $0.75 for a single tube (one biochemical test) of Christiansen urea agar. The value of the RapID NH system for the technologist is that it is a panel of 12 biochemical tests instead of a single test (such as urea alone) and thus can provide a biochemical profile of the organism being tested. This gives the technologist some confidence that the organism being tested is not identified from the result of a single biochemical test.

* Corresponding author.

We thank Brenda Williams for assistance with the manuscript and with preparation of the experiments.

LITERATURE CITED

1. **Marshall, B. J.** 1986. *Campylobacter pyloridis* and gastritis. J. Infect. Dis. **153**:650–657.
2. **McNulty, C. A. M., and J. C. Dent.** 1987. Rapid identification of *Campylobacter pylori* (*C. pyloridis*) by preformed enzymes. J. Clin. Microbiol. **25**:1683–1686.
3. **Megraud, F., F. Bonnet, M. Garnier, and H. Lamouliatte.** 1985. Characterization of "*Campylobacter pyloridis*" by culture, enzyme profile, and protein content. J. Clin. Microbiol. **22**:1007–1010.