Matters arising

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Reference

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How specific is the rapid urease test for diagnosing *Campylobacter pylori*?

We read with interest, the letter to the editor by Vaira *et al.*¹ We describe our experience with the rapid urease test, which differs from that reported by Vaira *et al.*¹ and from those reported earlier.²⁻⁵

Three pieces of antral biopsy specimen were taken from 53 patients with dyspepsia. Two pieces were transported to the microbiology laboratory, one piece for Gram staining and another for culture in the *Campylobacter* medium; a third piece was immersed in CLO-gel, as described by Marshall *et al.*⁵ Results were read after 20 minutes, three hours, and 24 hours. Twelve (20.6%) cases grew *Campylobacter pylori* (table).

The sensitivity of the rapid urease test has been shown to vary from 59-97%,¹⁻⁴ but our study shows a sensitivity of 100%. Unlike studies showing 100% specificity^{1,5} this study showed a specificity of 95.7% at 20 minutes, 93.5% at three hours, and 80.4% at 24 hours. Unlike other studies there were no false negative results with the test,² but there was a false positive rate of 4.4% at 20 minutes, 6.5% at three hours, and 19.6% at 24 hours.

Vaira *et al.* concluded that a positive *C. pylori* (CP) test before 20 minutes of incubation is strong evidence of *C. pylori* infection. To substantiate the authors' observation, it

would be important to know the sensitivity, specificity, false positive and false negative rates at 20 minutes, three hours, and 24 hours of the CP test compared with those of the 2% RUT and CLO-tests. Results of the CLO-test were read at 20 minutes, 90 minutes, and 24 hours; results of the 2% RUT were read at three hours, four hours, and six hours; results of the CP test were read at 15 minutes, 20 minutes, and two hours. We feel that it would have been better if the results were read at the same time intervals with these three tests.

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- 4 Das SS, Bain LA, Karim QN, Coelho LG, Baron JH. Rapid diagnosis of *Campylobacter pyloridis* infection. *J Clin Pathol* 1987;40:701-2.
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Drs Vaira, Holton, and Salmon comment:

In reply to Bhasin *et al.*, our conclusion that "a positive *Campylobacter pylori* test (CP-test) before 20 minutes' incubation is strong

evidence of *C. pylori* infection" is based on the results of our rapid 6% urea test (CP-test) and does not refer to other urease tests.

The specificity and sensitivity of the tests at different times are given in the test of our original letter.

All the three tests were compared—the 2% urea test; 6% urea test (CP-test), and CLO-test—were done at five, 10, and 20 minutes. The results at one, three, and 24 hours are also given in our letter.

Demonstration of aluminium on bone using different staining techniques and spectrophotometry

We were interested to see the paper of Ellis *et al.*¹ To our knowledge, it is the first time that anyone has attempted to validate the technique we originally described in 1985² for showing the presence of aluminium within bone, and we note with some pleasure that they have been able to confirm our results.

We have now examined more than 1800 biopsy specimens using the solochrome azurine technique and have had an opportunity on many occasions to compare the stain distribution with that perceived by energy and wavelength dispersive electron probe analysis, secondary ion mass spectrometry, and laser microprobe mass analysis, and believe we can resolve two of the anomalies described by Ellis *et al.*

The "false" positivity that they describe is not false but real. Atomic absorption spectrophotometry (AAS) by its nature gives a measure of aluminium expressed as a proportion of total dried weight of bone. Localised deposits of aluminium, as frequently occur after treatment of aluminium related renal osteodystrophy (AIROD), would be "diluted" out by AAS analysis giving a low mean aluminium concentration, whereas in truth, the local concentration may be relatively high and well within the concentration range detected by solochrome azurine. Thus by comparison with AAS, solochrome azurine may appear to be reacting with bone containing only low aluminium concentrations. The obverse may also apply. Aluminium may be deposited diffusely within bone but with local concentrations too low to be detected by solochrome azurine. We have found this to be particularly true in patients with a moderately decreased glomerular filtration rate in regions like ours where the ionic aluminium content of tap water is relatively high. This group of patients gradually accumulate aluminium in bone but the concentration in the extracellular fluid is

Table Comparative efficacy of various tests for *Campylobacter pylori*

	Culture	Gram staining	Rapid urease test at:		
			20 minutes	3 hours	24 hours
Positive	12	10	14	15	21
Negative	46	48	44	43	37
Sensitivity		83.33%	100%	100%	100%
Specificity	100%	100%	95.65%	93.48%	80.43%
False positive		0	4.35%	6.52%	19.57%
False negative		16.67%	0	0	0