a day. At this time the platelet count was 256 $\times 10^9$/l. Over the next nine days the cellulitis improved slightly, but on the ninth day a few purpuric lesions were seen on the lower limbs. These extended within 24 hours and the platelet count on the tenth day was 3×10^9/l with a normal haemaglobin and white cell count. A bone marrow aspirate taken at this time showed hypercellularity and increased megakaryocytes, consistent with accelerated platelet destruction. Cephamandole was then stopped, four units of platelet concentrates were given, and cephalexin was started in an oral dose of 1g five times a day 12 hours later. The platelet count increased steadily thereafter and returned to normal within four days. Cephalexin was continued at the same doses during the subsequent three months and the platelet count remained normal throughout.

Drug dependent platelet antibodies were shown using an immunofluorescence procedure[4] with about 5mg of cephamandole added to the incubation mixture of patient's serum and platelets. Patient's serum and the antibiotic solution were tested separately as controls.

Other drugs given at the same time as cephamandole were frusemide, Slow K, sulindac, ibuprofen, panadeine, anginine, palfium, isosorbide dinitrate and rifampicin. All of these had been given for lengthy periods prior to the onset of thrombocytopenia, and with the exception of rifampicin, were continued subsequently without any adverse effects.

The table shows the results of the platelet antibody immunofluorescence test (PIFT) performed in the presence of various cephalosporins and rifampicin, which was included as this was the only other drug discontinued at the same time as cephamandole. Platelet bound antibody was shown in the presence of cefaperazone and moxalactam, as well as cephamandole, but not in the presence of cefoxitin, cephalothin, cephalexin or rifampicin. The former three antibiotics possess a common thiomethyltetrazole group on the R2 side chain that is absent from the latter drugs.

Table *Platelet antibody immunofluorescence test using patient's serum and pooled normal platelets*

In the presence of:	*Result*
No drug	–
Cephamandole*	+++
Cefoperazone	+++
Moxalactam	+++
Cefoxitin	–
Cephalothin	–
Cephalexin†	–
Rifampicin	–

*Associated with thrombocytopenia in patient.
†Used to treat patient without adverse effects.

The patient had had no known previous exposure to cephalosporins or any other drug possessing a thiomethyltetrazole group. Cephazolin, however, which he had been previously given in a single dose, possesses a similar tetrazole group on the R1 side chain. Unfortunately, insufficient serum was available to perform the PIFT in the presence of cephazolin, or a similar side chain structure isolated from the antibiotics, but it is possible that this antibiotic, given 18 months earlier induced an initial immune response.

This seems to be the first reported case of cephalosporin sensitivity selectively involving only those drugs with a thiomethyltetrazole group on the R2 side chain. The apparent rarity of this occurrence would not seem to justify changing prescribing habits for cephalosporins.

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References

1 Gralnick HR, McGinnis M, Halterman R. Thrombocytopenia with sodium cephalothin therapy. *Ann Intern Med* 1972;77:401–4.
2 Sheiman L, Spielvogel AR, Horowitz HI. Thrombocytopenia caused by cepalothin sodium. *JAMA* 1968;203:159–61.
3 Naraqi S, Raiser M. Nonrecurrence of cephalothin—associated granulocytopenia and throbocytopenia. *J Infect Dis* 1982;145:281.
4 Von Dem Borne AEG Kr, Verheugt FWA, Oosterhof F, *et al.* A simple immunofluorescence test for the detection of platelet antibodies. *Br J Haematol* 1978;39:195–207.

Rapid diagnosis of *Campylobacter pyloridis* infection

A characteristic feature of *Campylobacter pyloridis*, an organism implicated as the aetiological agent of gastritis and possibly gastric ulcers also, is the production of large quantity of extracellular urease.[1] Hazell and Lee[2] postulated a role for this enzyme in the pathogenesis of these diseases. Other investigators used this property to facilitate rapid diagnosis of *C pyloridis* infection by testing for the presence of preformed urease in biopsy specimens taken at endoscopy.[3 4]

We report here our findings from two separate studies, one done in London and one in Belo Horizonte, Brazil, on the reliability of the urease test as a rapid diagnostic test for infection associated with *C pyloridis*. In both studies mucosal biopsy specimens were taken from the gastric antrum, duodenum, and oesophagus from patients attending the endoscopy clinic for investigation of upper gastrointestinal symptoms.

In the study at St Charles's Hospital, London 199 biopsy specimens were available from 111 patients. Specimens were processed immediately or kept at 4°C for not longer than two hours before processing in the laboratory. The same specimen was used for all the tests. It was crushed before being first inoculated on to blood agar and *C pyloridis* selective media for culture at 37°C in microaerophilic conditions for up to six days, then used to make a smear for Gram staining, and finally placed in 0·5 ml of Christensen's 2% urea broth and left at room temperature for up to 24 hours to detect preformed urease. A colour change from brown to pink indicated a positive test.

In the Brazilian study 67 sets of biopsy specimens were taken from 51 patients for analysis. Each set consisted of three specimens, one for culture, one for Gram stain, and one for the urease test. The previously crushed and ground specimens were processed fresh in the endoscopy unit. The media used and the method of reading the results were the same as those in the London study.

Detection of *C pyloridis* by culture or Gram stain, or both, was taken as the standard with which the urease test had to be compared. Table 1 shows that the urease test has a specificity of 88% and a sensitivity of 74%, when applied to biopsy specimens from the gastric antrum. These contrast with figures of 100% and 88%, respectively, reported by McNulty and Wise.[3 5]

When oesophageal and duodenal biopsy specimens are also included in the analysis, the specificity of the urease test is found to be 86% while the sensitivity is only 59%, with a false positive rate of 28% (table 2). These are almost identical with the figures of

Table 1 *Detection of C pyloridis in gastric antrum*

	Culture or Gram stain for C pyloridis		
Urease	*Positive*	*Negative*	*Total*
Positive	37	4	41
Negative	13	29	42
Total	50	33	83

Table 2 *Detection of C pyloridis in gastric antrum, duodenum and oesophagus*

	Culture or Gram stain for C pyloridis		
Urease	*Positive*	*Negative*	*Total*
Positive	44	17	61
Negative	30	108	138
Total	74	125	199

Table 3 *Detecting C pyloridis in gastric antrum, duodenum and oesophagus (Brazilian study)*

	Culture or Gram stain for C pyloridis		
Urease	*Positive*	*Negative*	*Total*
Positive	32	2	34
Negative	21	12	33
Total	53	14	67

86% and 60% for specificity sensitivity, respectively, obtained from our Brazilian study (table 3). Processing specimens immediately in the endoscopy unit and using the same specimen for the urease test seem to make no appreciable difference to the sensitivity and specificity of the test. The increase in false positive results may be explained by the fact that in the oesophagus and the duodenum the suppressive effect of gastric acid on the growth of contaminant microbial flora may not be as great as that in the gastric antrum.

On the basis of our results, we cannot recommend the biopsy urease test as a reliable and rapid test to assist in the diagnosis of *C pyloridis* infection, at least in sites other than in the gastric antrum. We also agree with Morris *et al*[4] that the test is really no faster than an adequate Gram stain, as most of our positive urease tests took longer than three hours to become positive.

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References

1 Langenberg ML, Tytgat GN, Schipper MEI, *et al*. Campylobacter-like organisms in the stomach of patients and healthy individuals. *Lancet* 1984;i:1348.
2 Hazell SL, Lee A. C pyloridis urease, hydrogen ion back diffusion, and gastric ulcers. *Lancet* 1986;ii:15.
3 McNulty CAM, Wise R. Rapid diagnosis of Campylobacter associated gastritis. *Lancet* 1985;i:1443.
4 Morris A, McIntyre D, Rose T, Nicholson G. Rapid diagnosis of C pyloridis infection. *Lancet* 1986;i:149.
5 McNulty CAM, Wise R. Rapid diagnosis of C pyloridis gastritis. *Lancet* 1986;i:387.

Simple half-Gram stain for showing presence of *Campylobacter pyloridis* in sections

Like Gray *et al*,[1] we have abandoned the Warthin-Starry technique for identifying gastric *Campylobacter pyloridis* in tissue sections, because it is unpredictable, time consuming, and expensive. As an alternative to their modified Giemsa technique we can also recommend a simple half-Gram method that we have been using for the past six months, and which shows well the characteristic morphology of the organisms (figure).

Paraffin embedded sections are dewaxed, taken to water, and stained for 30 seconds in a 1/20 aqueous dilution of Hucker's stain (one part 10% alcoholic crystal violet plus four parts 1% ammonium oxalate). After a rinse in water they are treated with Lugol's iodine for 60 seconds, washed in tap water, then blotted and allowed to dry thoroughly before clearing in xylene and mounting in DPX.

Most of our patients investigated for the presence of *C pyloridis* have paired biopsy specimens taken, one for histology and one for culture. The biopsy specimen for culture is ground, and the suspension is plated on to 5% blood agar and also on to fastidious anaerobe agar (Lab M), containing nalidixic acid 10 mg/l, vancomycin 2·5 mg/l, and 5% horse blood. The plates are incubated for seven days at 37°C in an atmosphere of nitrogen containing 5% oxygen and 6% carbon dioxide. Isolates are identified by colonial and morphological appearance, and by a rapid urease reaction.

The results of the histological half-Gram method correlated with those of culture in 91% of cases, which is similar to the experience of Marshall *et al*[2] using the Warthin-Starry stain. Of 102 paired biopsy specimens received, 45 were negative and 48 positive by both methods. Seven positive by the half-Gram method were culture negative, and in two cases culture was positive but no bacteria could be seen in half-Gram stained sections of the paired biopsy specimens.

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References

1 Gray SF, Wyatt JI, Rathbone BJ. Simplified techniques for identifying Campylobacter pyloridis. *J Clin Pathol* 1986;**39**:1279.
2 Marshall BJ, McGechie DB, Rogers PA, Glancy RJ. Pyloric campylobacter infection and gastroduodenal disease. *Med J Aust* 1985;**142**:439–44.

Isolation of *Campylobacter*: what are we missing?

Numerous selective media have been described for the isolation of campylobacters, almost all containing several antibiotics as inhibitory agents. A method

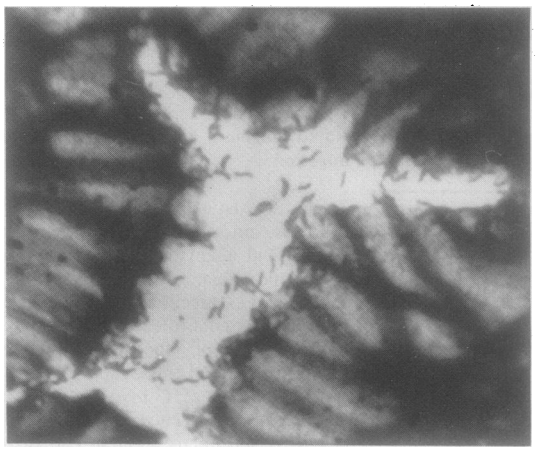

Figure
Gastric pit. (Half-Gram).