Table Sensitivity, specificity and positive predictive value of Gram stained smear to detect N gonorrhoeae

Micro/Cult	♂Urethral n = 6451	♂Rectal n = 1355	♀Urethral n = 5903	♀Cervical n = 6122	♀Rectal n = 51
+/+	231	40	7	8	0
sp/+	5	6	3	4	0
+/−	12	6	7	6	1
sp/−	4	10	1	1	2
−/+	28	80	30	41	3
−/−	6171	1213	5855	6062	45
Sensitivity	89%	40%	25%	29%	0%
Specificity	99%	98%	99%	99%	—
Positive Predictive Value	0·98	0·83	0·94	0·95	0·3
Sensitivity at re-audit	76%	41%	36%	38%	50%

sp = suspicious pairs; micro = microscopy; cult = culture.

(71%) of which were diagnosed by Gram stained smear.

The findings were presented to the clinic staff and it was recommended that particular care should be taken to clean the cervix prior to sampling and that rectal samples should be taken from "clear" areas of mucosa at proctoscopy in order to reduce the proportion of inadequate slides. In addition, nursing staff should practice microscopy with known positive slides and have regular training in Gram stain technique. The audit was then repeated over the next three months. No significant difference was found in the detection rates of gonorrhoea on repeating the audit (see table). The male rectal and female "specimen" diagnosis rates had improved but the small numbers of cases means that a statistically significant difference will be difficult to achieve.

This study shows that although the detection rate for gonorrhoea in male urethral specimens was satisfactory, the detection rates in female and rectal slides remained poor by comparison with a similar study conducted at this centre in 1973.[2] It should be noted, however, that in 1973 there were 441 cases of gonorrhoea in women and in 1991 only 70. Interestingly, comparison of the sensitivity of microscopy performed by MLSOs in a genitourinary service allied to our centre under clinic conditions showed no significant difference from the study presented. Improvement in the diagnosis rate was found in those cases of symptomatic infection, as has been described by previous surveys,[3] in those cases known to be contacts of gonorrhoea, and when suspicious pairs seen on microscopy were regarded as positive findings. Finally, we would re-emphasize the importance of careful specimen taking by the attending physician and of continual in-post training for those performing microscopy, especially where positive findings are few.

J K EVANS
D E MERCEY
P D FRENCH
Department of Genitourinary Medicine, Middlesex Hospital
M V PRINCE
Department of Microbiology, University College Hospital, London, UK

Address for correspondence: Dr J K Evans, Department of Genitourinary Medicine, The Ambrose King Centre, The Royal London Hospital, Whitechapel, London E1 1BB, UK.

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High level ciprofloxacin resistance in *Neisseria gonorrhoeae*

Neisseria gonorrhoea has been regarded as highly susceptible to ciprofloxacin (MIC_{90}: < 0·025 mg/l). Limited clinical resistance to ciprofloxacin[1 2] and other quinolone antibiotics has been reported (MIC_{90}: < 0·125 mg/l).[3] In November 1993 we isolated *N gonorrhoeae* from an infection acquired in northern Spain which expressed levels of resistance to ciprofloxacin more commonly associated with *Enterobacteriaciae* (MIC_{90}: 16mg/l). In this region, markedly increased resistance has been linked recently with widespread medical and veterinary use of quinolones.[4] We briefly describe the clinical and bacteriological findings of the case.

A 37 year old seaman presented at the department of genitourinary medicine with an urethral discharge and dysuria which had begun one week previously. He gave a history of vaginal sexual intercourse with an unknown prostitute in Bilbao, Spain, 24 hours before the onset of symptoms. His previous sexual intercourse had taken place 10 months earlier. Six days before presentation, he had commenced oral ciprofloxacin, 250 mg twice daily for five days without improvement. Examination confirmed the presence of a purulent urethral discharge and an urethral smear showed intracellular Gram-negative diplococci. He was treated with 1·5 g cefuroxime intramuscularly followed by oral doxycycline 100mg twice daily for seven days.

B-lactamase producing *N gonorrhoeae* was isolated from the urethral swab. On susceptibility testing, no zones of inhibition were obtained with nalidixic acid (30 μg) or ciprofloxacin (1 μg and 5 μg) discs. The MIC to ciprofloxacin was 16·0 mg/l (plate incorporation method). By disc diffusion tests, the

isolate was found to be susceptible to tetracycline, spectinomycin, and cefuroxime. The identity of the organism was confirmed as *N gonorrhoeae* auxotype PA, serotype IB3 by the Gonococcus Reference Laboratory (Bristol, UK). Plasmid DNA (2·6, 4·4 and 25 MDal) was extracted using a commercial resin system (Diagen GmbH.) and transformed into *Escherichia coli* k-12 ($r_k - m_k +$). *B*-lactam but not ciprofloxacin resistance was transformed. On subsequent follow up, two weeks after presentation, the patient's symptoms had resolved and culture of further swabs for *N gonorrhoea* were negative. To date, enquiries with local infection control authorities (Servicio E.T.S.) in Bilbao have not discovered further ciprofloxacin resistant isolates. It is unfortunate that we were able to supply them with so little information to help trace the contact.

This isolate demonstrates a level of resistance to ciprofloxacin not previously reported in the gonoccus and suggests a change in the genetic mechanism(s) controlling its susceptibility to quinolones. We were unable to demonstrate plasmid carriage of ciprofloxacin resistance encoding genes in the isolate. It is therefore unlikely that it acquired resistance from the widespread local resistant enterobacteriae. As Dr Bogaerts and colleagues show,[4] even where quinolone use is very limited, resistance seems to rise. The continued heavy use of quinolones in many parts of the world is likely to increase selection pressure for highly resistant strains such as this.

HUMPHREY BIRLEY
PATRICK MCDONALD
PETER CAREY
Departments of Genitourinary Medicine and Medical Microbiology, Royal Liverpool University Hospital, Liverpool L7 8XP
JON FLETCHER
Department of Genetics and Microbiology, University of Liverpool, Liverpool L69 3BX, UK

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