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In Vitro Activity of Lomefloxacin, a New Quinolone Antimicrobial Agent, in Comparison with Those of Other Agents

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The in vitro activity of lomefloxacin (SC-47111; NY-198), a new difluorinated quinolone, was compared with those of ofloxacin, ciprofloxacin, fleroxacin, amoxicillin, cefuroxime, and trimethoprim against 585 recent clinical isolates and other strains with known mechanisms of resistance. The MICs of lomefloxacin against 90% of the members of the family *Enterobacteriaceae*, *Pseudomonas aeruginosa*, and staphylococci were between 0.25 and 4 μg/ml. Ninety percent of *Neisseria* sp. and *Haemophilus influenzae* were susceptible to ≤0.06 μg/ml, and streptococci (including *Streptococcus pyogenes*, *Streptococcus pneumoniae*, and enterococci) and *Bacteroides fragilis* were susceptible to 8 μg/ml. Lomefloxacin was comparable in activity to fleroxacin and ofloxacin, but it was less active than ciprofloxacin. There was cross-resistance between the quinolone group of antimicrobial agents. The protein binding of lomefloxacin was 15.4%, and serum had little effect on the activity of the compound. However, urine at pH 5.0 decreased the activity by two- to eightfold compared with that at pH 7.0.

Lomefloxacin (SC-47111; NY-198) is a new difluorinated quinolone with the formula 1-ethyl-6,7-difluoro-1,4-dihydro-7-(3-methyl-1-piperazinyl)-4-oxo-quinoline carboxylic acid. In earlier studies (2) in which this agent was compared with ofloxacin and norfloxacin, a similar degree of activity was shown. We evaluated the activity of this compound compared with those of ciprofloxacin, fleroxacin (another multifluorinated agent) (3), ofloxacin, amoxicillin, cefuroxime (as representative β-lactams), and trimethoprim. Other agents were included in this study, as appropriate.

MATERIALS AND METHODS

A total of 640 strains were studied, of which 585 were recent clinical isolates; 55 of the strains were well-characterized β-lactamase producers, had altered expression of porin proteins, or were collected from other laboratories, having been originally isolated from clinical trials and known to show reduced susceptibility to quinolone antimicrobial agents.

The following antimicrobial agents were studied and were obtained from the indicated sources: lomefloxacin, Searle Laboratories, High Wycombe, England; ofloxacin, Hoechst Laboratories, Uxbridge, England; fleroxacin, Hoffmann-La Roche, Basel, Switzerland; ciprofloxacin, Bayer AG, Wuppertal, Federal Republic of Germany; amoxicillin, penicillin, and methicillin, Beecham Research Laboratories, Brentford, England; cefuroxime, Glaxo Group Research, Greenford, England; trimethoprim, Wellcome Laboratories, Crewe, England.

Susceptibility testing. The susceptibilities of the strains to the compounds were studied by a routine agar plate dilution method. The inocula were prepared as follows. For all strains except streptococci (including *Streptococcus pneumoniae*), *Neisseria* spp., *Haemophilus influenzae*, and anaerobes, the organisms were grown overnight in nutrient broth to yield a viable count of about 10^9 CFU/ml. Streptococci, *H. influenzae*, and *Neisseria* spp. were grown in brain heart infusion broth (Oxoid Ltd., Basingstoke, England) plus 1% supplement C (Difco Laboratories, East Molesley, England). *Bacteroides* spp. were grown in Wilkins-Chalgren broth (Oxoid Ltd.)–0.25% sodium succinate. Clostridia were grown in Wilkins-Chalgren broth supplemented with 1% Tween 80 (which was previously shown to enhance growth). The viable counts were comparable for each broth sample.

The inocula were obtained by transferring 1 μl of an undiluted culture or a 1:100 dilution of the overnight culture to the surface of the antibiotic-containing agar with a multipoint inoculating device (Denley-Tech, Billingshurst, England). The final inocula on the plates were therefore 10^4 and 10^6 CFU, respectively.

The medium used for the agar dilution procedure was Iso-Sensitest agar (pH 7.2; Oxoid) and was supplemented with 5% horse blood–1% supplement C, to support growth of streptococci, *H. influenzae*, and *Neisseria* spp.; for anaerobes Wilkins-Chalgren agar was used.

All plates were incubated in air at 37°C for 24 h, except for the following. The anaerobes were grown in an anaerobic cabinet in an atmosphere of 10% hydrogen–10% carbon dioxide–80% nitrogen; *H. influenzae* and *Neisseria* spp. were incubated in air enriched with 6% carbon dioxide. In addition, *Staphylococcus aureus* was also incubated in air at 30°C, with 5% sodium chloride added to the medium. The MIC of the antibiotic was defined as that concentration (in micrograms per milliliter of agar) at which no more than two colonies were detected. In the case of the higher inoculum a slight haze of growth was ignored.

The effect of human serum and urine on the MIC and MBC of lomefloxacin was studied with nine strains (two each of *Klebsiella* spp., *Proteus mirabilis*, *Escherichia coli*, and *Pseudomonas aeruginosa* and one strain of *Staphylococcus aureus*) by a method based on that of Pearson et al. (4); the bactericidal endpoint was 99.9% lethality. An overnight broth culture of these organisms was inoculated into 1 ml of Iso-Sensitest broth with 0 and 70% human serum and fresh pooled human urine at pHs of 5.0 and 7.0 and decreasing concentrations of the antimicrobial agent.

The protein binding of lomefloxacin was estimated in triplicate in human serum by an ultrafiltration technique with

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TABLE 1. Activity of lomefloxacin compared with those of other agents

Organism (no. of strains)	Antimicrobial agent	MIC (μg/ml)		
		50%	90%	Range
Escherichia coli (66)	Lomefloxacin	0.12	1	0.06–4
	Ofloxacin	0.06	1	0.03–1
	Fleroxacin	0.12	2	0.12–2
	Ciprofloxacin	0.03	0.25	0.015–1
	Amoxicillin	32	>128	1–>128
	Cefuroxime	2	8	0.12–16
	Trimethoprim	0.25	>128	0.06–>128
Klebsiella pneumoniae (58)	Lomefloxacin	0.25	2	0.06–16
	Ofloxacin	0.12	1	0.03–4
	Fleroxacin	0.25	2	0.06–4
	Ciprofloxacin	0.03	0.5	0.008–8
	Amoxicillin	>128	>128	4–>128
	Cefuroxime	2	16	0.25–>128
	Trimethoprim	0.5	>128	0.12–>128
Proteus mirabilis (50)	Lomefloxacin	0.25	0.5	0.12–4
	Ofloxacin	0.12	0.25	0.06–2
	Fleroxacin	0.12	0.5	0.12–4
	Ciprofloxacin	0.03	0.12	0.015–1
	Amoxicillin	0.5	>128	0.25–>128
	Cefuroxime	0.5	4	0.5–4
	Trimethoprim	0.5	16	0.12–>128
Proteus vulgaris (21)	Lomefloxacin	0.12	0.25	0.12–0.5
	Ofloxacin	0.06	0.12	0.06–0.25
	Fleroxacin	0.12	0.12	0.12–0.5
	Ciprofloxacin	0.03	0.03	0.015–0.12
	Cefuroxime	64	>128	1–>128
	Trimethoprim	2	>128	0.25–>128
Morganella morganii (22)	Lomefloxacin	0.12	0.25	0.03–0.5
	Ofloxacin	0.12	0.25	0.03–0.25
	Fleroxacin	0.12	0.5	0.06–0.5
	Ciprofloxacin	0.015	0.03	0.008–0.12
	Cefuroxime	16	64	1–64
	Trimethoprim	1	>128	0.5–>128
Salmonella spp. (12)	Lomefloxacin	0.12	0.25	0.12–0.25
	Ofloxacin	0.12	0.12	0.12
	Fleroxacin	0.25	0.25	0.12–0.25
	Ciprofloxacin	0.03	0.06	0.03–0.06
	Amoxicillin	1	1	0.5–1
	Cefuroxime	4	8	2–16
	Trimethoprim	0.25	0.5	0.25–0.5
Enterobacter spp.[a] (51)	Lomefloxacin	0.25	2	0.12–8
	Ofloxacin	0.12	1	0.03–4
	Fleroxacin	0.12	2	0.06–8
	Ciprofloxacin	0.03	0.5	0.015–2
	Trimethoprim	0.5	>128	0.06–>128
Serratia spp.[b] (29)	Lomefloxacin	0.25	4	0.06–8
	Ofloxacin	0.25	1	0.03–8
	Fleroxacin	0.25	2	0.06–8
	Ciprofloxacin	0.06	1	0.008–2
	Trimethoprim	0.5	>128	0.25–>128
Providencia stuartii (20)	Lomefloxacin	0.5	1	0.12–16
	Ofloxacin	0.5	1	0.06–2
	Fleroxacin	0.25	0.5	0.12–4
	Ciprofloxacin	0.12	0.5	0.015–8
	Cefuroxime	1	16	0.12–64
	Trimethoprim	32	>128	1–>128
Pseudomonas aeruginosa (42)	Lomefloxacin	1	4	0.5–16
	Ofloxacin	1	2	0.25–16
	Fleroxacin	1	2	0.5–32
	Ciprofloxacin	0.12	0.5	0.03–4

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TABLE 1—*Continued*

Organism (no. of strains)	Antimicrobial agent	MIC (μg/ml)		
		50%	90%	Range
Acinetobacter spp.[c] (15)	Lomefloxacin	1	2	0.25–2
	Ofloxacin	0.5	1	0.06–1
	Fleroxacin	0.5	2	0.12–2
	Ciprofloxacin	0.25	1	0.12–1
	Amoxicillin	16	16	8–16
	Cefuroxime	32	64	4–64
	Trimethoprim	4	16	2–16
Haemophilus influenzae[d] (32)	Lomefloxacin	0.06	0.12	0.06–0.12
	Ofloxacin	0.03	0.03	0.015–0.06
	Fleroxacin	0.03	0.06	0.03–0.12
	Ciprofloxacin	0.015	0.015	0.008–0.03
	Amoxicillin	2	16	0.25–16
	Cefuroxime	0.5	1	0.25–2
	Trimethoprim	0.12	16	0.06–32
Neisseria gonorrhoeae[e] (41)	Lomefloxacin	0.015	0.03	0.008–0.5
	Ofloxacin	0.008	0.015	0.004–0.25
	Fleroxacin	0.015	0.015	0.008–0.25
	Ciprofloxacin	0.004	0.015	≤0.002–0.25
	Amoxicillin	0.03	0.12	0.015–128
	Cefuroxime	0.015	0.06	0.004–0.25
	Trimethoprim	4	8	0.5–8
	Penicillin	0.015	0.06	0.008–64
Bacteroides fragilis (15)	Lomefloxacin	8	8	4–16
	Ofloxacin	4	8	4–8
	Fleroxacin	8	16	8–16
	Ciprofloxacin	8	8	4–16
	Trimethoprim	4	16	4–32
Clostridium spp.[f] (17)	Lomefloxacin	2	16	0.5–16
	Ofloxacin	1	8	0.25–8
	Fleroxacin	2	16	0.5–16
	Ciprofloxacin	0.5	8	0.12–8
	Amoxicillin	0.12	4	0.12–4
	Cefuroxime	2	64	1–64
Peptostreptococcus sp. (10)	Lomefloxacin	1	4	1–4
	Ofloxacin	0.5	2	0.5–4
	Fleroxacin	1	8	1–8
	Ciprofloxacin	0.5	2	0.25–2
	Amoxicillin	2	2	2
	Cefuroxime	0.25	0.25	0.12–0.25
Staphylococcus aureus (34)	Lomefloxacin	1	1	0.5–4
	Ofloxacin	0.5	0.5	0.25–1
	Fleroxacin	0.5	1	0.25–4
	Ciprofloxacin	0.5	1	0.12–4
	Amoxicillin	1	64	0.06–64
	Methicillin	2	32	1–>128
	Trimethoprim	0.5	4	0.12–4
Staphylococcus saprophyticus (20)	Lomefloxacin	2	2	0.5–2
	Ofloxacin	1	1	0.25–1
	Fleroxacin	4	4	0.25–4
	Ciprofloxacin	0.5	0.5	0.12–0.5
	Amoxicillin	0.5	0.5	0.03–1
	Methicillin	8	8	0.5–8
	Trimethoprim	0.25	0.5	0.12–2
Staphylococcus epidermidis (20)	Lomefloxacin	1	4	0.5–8
	Ofloxacin	0.5	2	0.25–4
	Fleroxacin	1	4	0.25–4
	Ciprofloxacin	0.25	2	0.12–4
	Amoxicillin	0.25	4	0.03–32
	Methicillin	2	4	0.5–64
	Trimethoprim	0.25	4	0.12–4

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TABLE 1—*Continued*

Organism (no. of strains)	Antimicrobial agent	MIC (μg/ml)		
		50%	90%	Range
Streptococcus pyogenes (10)	Lomefloxacin	4	8	4–16
	Ofloxacin	1	1	1–4
	Fleroxacin	4	4	4–16
	Ciprofloxacin	0.5	0.5	0.5–1
	Amoxicillin	0.015	0.03	0.015–0.03
	Cefuroxime	0.015	0.015	0.008–0.015
	Trimethoprim	0.5	1	0.5–1
	Penicillin	0.015	0.015	0.008–0.015
Enterococci (Lancefield group D) (10)	Lomefloxacin	8	8	4–8
	Ofloxacin	2	2	2
	Fleroxacin	4	4	4
	Ciprofloxacin	2	2	1–2
	Amoxicillin	1	1	0.5–1
	Trimethoprim	0.5	2	0.25–2
Streptococcus pneumoniae (20)	Lomefloxacin	8	8	4–8
	Ofloxacin	1	2	1–2
	Fleroxacin	4	8	4–8
	Ciprofloxacin	1	1	0.25–2
	Amoxicillin	0.03	0.12	0.015–0.25
	Cefuroxime	0.015	0.015	0.015–0.03
	Trimethoprim	1	1	0.5–2

[a] Includes 36 *Enterobacter cloacae*, 12 *Enterobacter aerogenes*, and 3 *Enterobacter agglomerans*.
[b] Includes 19 *Serratia marcescens* and 10 *Serratia liquefaciens*.
[c] Includes eight *Acinetobacter anitratus*, two *Acinetobacter lowffii*, and five *Acinetobacter calcoaceticus*.
[d] Includes 13 β-lactamase producers.
[e] Includes three β-lactamase producers.
[f] Includes six *Clostridium difficile*.

a Centriflo cone (Amicon Corp., Lexington, Mass.) with an exclusion limit of 50,000 daltons. The concentrations of lomefloxacin used were 2, 5, and 10 μg/ml. The ultrafiltrate (after pH adjustment with CO_2 gas to precentrifugation values) was assayed by a microbiological method against standards prepared in phosphate buffer at pH 6.5 (the pH of the ultrafiltrate). The indicator organism was *Escherichia coli* Sch 12655 (from Schering Laboratories, Bloomfield, N.J.), and the medium was Oxoid antibiotic no. 1.

The activities of lomefloxacin, ciprofloxacin, and tetracycline against three freshly isolated strains of *Chlamydia trachomatis* were determined by using a recently developed fluorescent antibody method (5a). Briefly, McCoy cell cover slip cultures treated with 5-iodo-2-deoxyuridine were infected with approximately 1,000 inclusion-forming units of *Chlamydia trachomatis*. The infected monolayers were then exposed to the various concentrations of the antimicrobial agents for 48 h and then stained by the immunofluorescent Imagen chlamydia test (Boots, Nottingham, England). The MIC was defined as the lowest concentration of antimicrobial agent which inhibited all inclusion development. The minimum lethal concentration was defined as the lowest concentration which inhibited inclusion development in cell sheets exposed to antimicrobial agents for 48 h and then reincubated in antibiotic-free medium for an additional 48 h.

RESULTS

The results obtained from 615 isolates tested at an inoculum of 10^4 CFU are summarized in Table 1 (included are data for the clinical isolates and β-lactamase producers, but not those for laboratory-derived mutants). Against members of the family *Enterobacteriaceae*, lomefloxacin displayed a degree of activity similar to those of fleroxacin and ofloxacin and was fourfold less active than ciprofloxacin. The *Enterobacteriaceae* tended to be susceptible to ≤1 μg of lomefloxacin per ml, with the following exceptions. *Serratia* sp. (MIC for 90% of the strains tested [MIC_{90}], 4 μg/ml) tended to be less susceptible to all the quinolones investigated. For *Klebsiella pneumoniae* (MIC_{90}, 2 μg/ml) the results were biased by the inclusion of three isolates with MICs of ≥4 μg/ml, which were isolated from clinical material and which were known to be resistant to other quinolones. Included in the study of the *Enterobacteriaceae* were strains known to be resistant to nalidixic acid. The nalidixic acid-resistant strains tended to be two- to fourfold less susceptible to lomefloxacin, like the other quinolones studied, compared with the nalidixic acid-susceptible strains of the same genus. Similarly, those strains included because they demonstrated resistance to the new quinolones showed cross-resistance to lomefloxacin (Table 2). Also included in Table 2 are results for four laboratory-produced mutants of *Escherichia coli* KL-16, *gyrA*, *nalB*, *nalC*, and *nalD*. As expected, the *gyrA*, *nalB*, and *nalD* strains were fourfold less susceptible than the wild type; and the *nalC* strain showed a greater susceptibility. Strains with characterized β-lactamases from Richmond and Sykes (5) groups I to V did not demonstrate any decrease in susceptibilities to the quinolones studied but did, as appropriate, show decreased susceptibilities to cefuroxime and amoxicillin.

The activity of lomefloxacin against *Pseudomonas aeruginosa* was comparable to those of fleroxacin and ofloxacin. Three strains were included which were isolated from treatment failures from a ciprofloxacin clinical trial; for these strains, lomefloxacin MICs were 8- to 16-fold greater; and these strains were less susceptible to the other quinolones (for example, ofloxacin MICs of 8, 8, and 16 μg/ml).

TABLE 2. Activity of lomefloxacin, ofloxacin, and ciprofloxacin against members of the family *Enterobacteriaceae* and *Pseudomonas aeruginosa* known to be resistant to quinolones or with known mechanisms of resistance

Strain	Source	MIC (μg/ml)		
		Lomefloxacin	Ofloxacin	Ciprofloxacin
Klebsiella pneumoniae				
H185	Sputum during ciprofloxacin therapy	32	8	8
H160	Urine during enoxacin therapy	16	8	4
Enterobacter cloacae				
K346	Feces during ciprofloxacin therapy	4	4	2
K007	Laboratory mutant	4	1	0.5
Pseudomonas aeruginosa 284	Wound during ciprofloxacin therapy	16	16	4
Escherichia coli				
I203	*gyrA*	0.5	0.25	0.12
I204	*nalB*	0.5	0.25	0.03
205	*nalC*	0.06	0.015	0.004
206	*nalD*	0.5	0.25	0.06
207	Wild-type KL-16	0.12	0.06	0.015

Strains of *H. influenzae* (including 13 β-lactamase producers) were highly susceptible to lomefloxacin; this agent was 128-fold more active than amoxicillin. The β-lactamase producers were equally as susceptible to lomefloxacin as the β-lactamase nonproducers. Strains of *Neisseria gonorrhoeae* (including three β-lactamase producers) were extremely susceptible to lomefloxacin, with all the strains being inhibited by ≤0.5 μg/ml. Seven strains of *Neisseria meningitidis* (data not shown) were inhibited by 0.015 μg of lomefloxacin per ml.

Lomefloxacin showed a similar poor degree of activity as the other quinolones against *Bacteroides fragilis*. *Clostridium perfringens* (seven strains) was more susceptible to lomefloxacin (mode MIC, 2 μg/ml) than were the six strains of *Clostridium difficile* studied (mode MIC, 16 μg/ml) (Table 3). Peptostreptococci were similarly less susceptible to all the quinolones than to cefuroxime. Eight strains of *Peptococcus* spp. again showed moderate susceptibilities to lomefloxacin (mode MIC, 4 μg/ml) and the other quinolones studied (data not shown).

Ofloxacin was the most active quinolone tested against strains of *Staphylococcus aureus*, but lomefloxacin was approximately as active as ciprofloxacin. Its activity was similar at 30°C to that at 35°C. Generally, all the quinolone agents were up to fourfold less active against *Staphylococcus epidermidis* than they were against *Staphylococcus aureus*. Ciprofloxacin was the most active quinolone studied against *Staphylococcus saprophyticus*, with these strains being fourfold more susceptible to ciprofloxacin than to lomefloxacin. Enterococci (Lancefield group D), *Streptococcus pneumoniae*, and *Streptococcus pyogenes* (Lancefield group A) were all markedly less susceptible to all the quinolones studied compared with their susceptibilities to amoxicillin. Lomefloxacin and fleroxacin were the least active agents against these strains and 10 Lancefield group B streptococci (data not shown).

The MICs of lomefloxacin for the three strains of *Chlamydia trachomatis* were 2 μg/ml; the MICs of ciprofloxacin were 1, 1, and 2 μg/ml; the MICs of tetracycline were 0.12 μg/ml. The minimum lethal concentrations were identical to the MICs for lomefloxacin; 1, 2, and 2 μg/ml for ciprofloxacin; and 0.25 μg/ml for tetracycline.

An increase in inoculum from 10^4 to 10^6 CFU had very little effect on the activity of any of the quinolones studied (data not shown). A more marked effect was seen with trimethoprim, and those strains which produced appropriate β-lactamases showed a marked effect (that is, a >fourfold increase in MIC) against the β-lactams studied.

Table 4 shows the effect of serum and urine on the MICs and MBCs for eight strains tested against lomefloxacin. Except against strain 1 of *Staphylococcus aureus* there was generally up to a fourfold difference in the MIC and MBC. Serum had little effect on the activity of this agent, but human urine at pH 5 decreased the activity two- to eightfold compared with that at pH 7. The mean protein binding of lomefloxacin was 15.4% (range, 11.0 to 19.7%). Over the range of lomefloxacin concentrations studied (2 to 10 μg/ml), protein binding did not vary with the concentration.

DISCUSSION

Lomefloxacin shares many in vitro similarities with another multifluorinated agent, fleroxacin (Ro 23-6240; AM 833) (3); both have activities comparable to that of ofloxacin. In general, the results from this study agree with those of Hirose et al. (2); however, there are some important exceptions. Hirose et al. (2) suggested that lomefloxacin was consistently about twofold more active against *Escherichia coli* and *Klebsiella pneumoniae* than we found in this investigation. A possible explanation for this is that we included strains known to be resistant to nalidixic acid and other quinolones and did not include known quinolone-susceptible strains. Hirose et al. (2) found the MIC_{90} for *Staphylococcus aureus* to be 3.1 μg/ml, whereas we found a value of 1 μg/ml. Similarly, Hirose et al. (2) stated that *Pseudomonas aeruginosa* was less susceptible to this agent (MIC_{90}, 12.5 μg/ml),

TABLE 3. Activity of lomefloxacin against miscellaneous organisms

Organism	MICs (μg/ml) for individual isolates[a]
Peptococcus spp.	2_2, 4_4, 8_2
Neisseria meningitidis	0.015_7
Clostridium perfringens	2_5, 1_1, 4_1
Clostridium difficile	16_5, 8_1

[a] The inferior number is the number of isolates for which the MIC was as indicated.

TABLE 4. Effect of serum and urine on the MIC and MBC of lomefloxacin

Organism	Concn (μg/ml) under the following conditions:							
	0% serum		70% serum		Urine			
					pH 5.0		pH 7.0	
	MIC	MBC	MIC	MBC	MIC	MBC	MIC	MBC
Escherichia coli								
1	0.25	0.5	0.06	0.12	2	2	0.5	2
2	0.25	0.5	0.12	0.5	2	2	0.25	0.25
Proteus mirabilis								
1	0.5	1	<0.03	0.25	2	2	0.5	1
2	0.25	1	<0.03	0.12	2	2	0.5	2
Pseudomonas aeruginosa								
1	1	8	0.5	2	16	16	2	4
2	1	4	2	4	16	32	4	32
Staphylococcus aureus								
1	0.5	8	0.5	64	1	1	0.5	1
2	1	4	0.5	4	2	4	1	4

whereas we found the strains to have an MIC_{90} of 4 μg/ml. Although *Bacteroides fragilis* is relatively resistant to lomefloxacin, the strains we studied were two- to fourfold more susceptible than those described by Hirose et al. (2) (MIC_{90}, 25 μg/ml). We cannot offer any explanation for these differences but note that the results we obtained in this study with the agents being compared were similar to those published previously (1, 6).

Lomefloxacin appears to be similar to other agents of this class, in that cross resistance with the other quinolones was observed. In particular, those clinical isolates and laboratory mutants previously known to exhibit resistance to earlier quinolones were less susceptible to lomefloxacin. However, strains known to be resistant to other groups of antimicrobial agents, such as the β-lactams, demonstrated no cross resistance to lomefloxacin or the other quinolones.

The activity of lomefloxacin against *Chlamydia trachomatis* was encouraging, in that it was comparable to the activity of ciprofloxacin and there was no difference between the inhibitory and lethal concentrations. A clinical study of lomefloxacin in chlamydial urethritis is therefore suggested.

As might be expected with a compound with low protein binding, serum had little effect on activity. In common with other quinolones (7), pH had a more marked effect on the MIC but, surprisingly, not on the MBC; bactericidal activity was similar to, or at most fourfold less, in urine at pH 5 compared with that at pH 7.

Preliminary studies on the pharmacokinetics of lomefloxacin suggest that maximum levels in serum of about 2 μg/ml are achieved rapidly after a 200-mg oral dose, about twice those after a similar dose of norfloxacin (S. Kamidono, A. Fujii, H. Nagata, J. Ishigani, 15th International Congress of Chemotherapy, abstr. no. 1340, 1987). This suggests that systemic infections caused by the common *Enterobacteriaceae*, *H. influenzae*, *Neisseria* spp. and staphylococci should be amenable to therapy. In the case of infections caused by less susceptible strains such as *Pseudomonas aeruginosa*, *Streptococcus pneumoniae*, and other streptococcal species, it is possible that a larger dose is required or that for treatment to be effective the infection should occur at a site at which the agent is concentrated. In addition, another favorable property of lomefloxacin is its relatively long serum elimination half-life of 7 to 8 h (M. Nakashima, T. Uematsu, Y. Takiguchi, A. Mizuno, M. Kanamaru, A. Tsuji, S. Kubo, O. Nagata, E. Okezaki, and Y. Takahara, 26th Intersci. Conf. Antimicrob. Agents Chemother. abstr. no. 430, 1986), suggesting a possible once daily dosing.

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