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Revised Abstract

Background: Finafloxacin is a novel member of the fluoroquinolone class of antibiotics. Specifically, finafloxacin belongs to a new 8-cyano subclass. The agent contains a novel base component which confers improved antibacterial activity under acidic conditions, where the activity of many existing fluoroquinolones is impaired. The current study compares the activity of finafloxacin (FIN) and moxifloxacin (MOX) against recent anaerobic clinical isolates. **Methods:** The activity of FIN and MOX against 216 anaerobic isolates from 2009-2010 were investigated under standard CLSI conditions by agar dilution. **Results:**

Species (n)	Drug	Min	Max	Mean	Median	MIC ₉₀
<i>Anaerococcus prevotii</i> (6)	FIN	≤.015	0.5	0.145	0.03	0.5
	MOX	0.03	1	0.41	0.12	1
<i>Bacteroides fragilis</i> group (108)	FIN	0.06	8	1.492	0.5	4
	MOX	0.12	16	2.29	0.25	8
<i>Clostridium difficile</i> (27)	FIN	0.06	8	2.812	2	8
	MOX	0.5	16	3.407	1	8
<i>Clostridium perfringens</i> (31)	FIN	≤.015	1	0.129	0.06	0.12
	MOX	0.12	1	0.338	0.25	0.5
<i>Finexgoldia magna</i> (11)	FIN	≤.015	8	1.704	0.12	4
	MOX	0.03	8	1.757	0.12	4
<i>Peptostreptococcus</i> spp.(24)	FIN	≤.015	4	0.239	0.06	0.25
	MOX	≤.015	4	0.308	0.06	0.5
<i>Peptoniphilus asaccharolyticus</i> (9)	FIN	≤.015	0.25	0.058	0.03	0.25
	MOX	0.06	1	0.198	0.12	1

Values shown are MICs expressed in mcg/ml.

Conclusions: FIN was generally more active than MOX against the seven different anaerobic species studied. Against five of the seven species, FIN MIC₉₀ values were 1 to 2 dilutions lower than MIC₉₀ values for MOX. Analysis of the mean MICs further showed that FIN was more active than MOX against most of the species tested.

Introduction

Finafloxacin is a novel member of the fluoroquinolone class of antibiotics. Specifically, finafloxacin belongs to a new 8-cyano subclass. The agent contains a novel base component which confers improved antibacterial activity under acidic conditions, where the activity of many existing fluoroquinolones is impaired. Finafloxacin is currently in clinical development with MerLion Pharmaceuticals. Under license with Alcon Pharmaceuticals, USA, finafloxacin is being developed for treating ear infections, including acute otitis externa (outer ear and ear canal) and acute otitis media (middle ear). In addition to otic and ophthalmic indications, finafloxacin, which has already shown potential for the treatment of a range of infections in Phase IIa clinical studies, is also being evaluated in critical care and hospital based infection settings.

One of the most extensively used therapies for the treatment of anaerobic infections is moxifloxacin. In order to better understand the utility of finafloxacin against anaerobes, the current study has evaluated a direct head to head comparison of the activity of finafloxacin as compared with moxifloxacin against a range of anaerobic species from a European population.

Materials & Methods

Clinical Isolates

A total of 216 clinical anaerobic isolates were tested comprising *Anaerococcus prevotii* (n = 6), *Bacteroides fragilis* group (n = 108), *Clostridium difficile* (n = 27), *C. perfringens* (n = 31), *Finexgoldia magna* (n = 11), *Peptostreptococcus* spp. (n = 24) and *Peptoniphilus asaccharolyticus* (n = 9). In addition the following CLSI ATCC isolates were tested: *B. fragilis* ATCC 25285, *B. thetaiotaomicron* ATCC 29741, *C. difficile* ATCC 700057 and *Eubacterium lentum* ATCC 43055

Anaerobic Antimicrobial Susceptibility Testing

Susceptibility testing of anaerobes with finafloxacin and moxifloxacin was performed in line with the Clinical and Laboratory Standards Institute (CLSI) guideline using agar dilution (Clinical and Laboratory Standards Institute. 2007. Methods for Antimicrobial Susceptibility Tests of Anaerobic Bacteria; Approved Standard—Seventh Edition. CLSI Document M11-A7. Wayne, PA.).

Results

Table 1. Activity of finafloxacin and moxifloxacin against *B. fragilis* ATCC 25285, *B. thetaiotaomicron* ATCC 29741, *C. difficile* ATCC 700057 and *E. lentum* ATCC 43055.

QC Organism	Drug	N	Min	Max	Mean	Median
<i>B. fragilis</i> ATCC 25285	Finafloxacin	10	0.12	0.12	0.12	0.12
	Moxifloxacin	10	0.12	0.12	0.12	0.12
<i>B. thetaiotaomicron</i> ATCC 29741	Finafloxacin	10	1	1	1	1
	Moxifloxacin	10	1	1	1	1
<i>C. difficile</i> ATCC 700057	Finafloxacin	10	1	1	1	1
	Moxifloxacin	10	1	1	1	1
<i>E. lentum</i> ATCC 43055	Finafloxacin	10	0.12	0.12	0.12	0.12
	Moxifloxacin	10	0.12	0.25	0.146	0.12

Values shown are MICs expressed in mcg/ml.

Figure 1. Comparison of the activity of finafloxacin and moxifloxacin against seven anaerobic species by mean MIC.

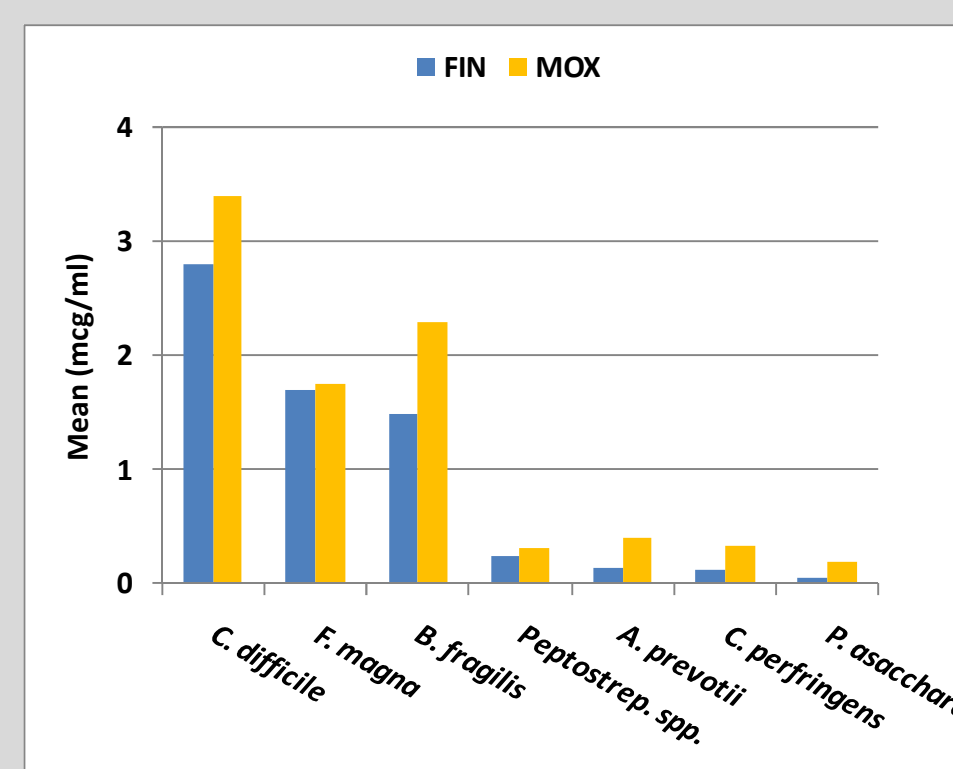


Figure 2. Comparison of the activity of finafloxacin and moxifloxacin against seven anaerobic species by median MIC.

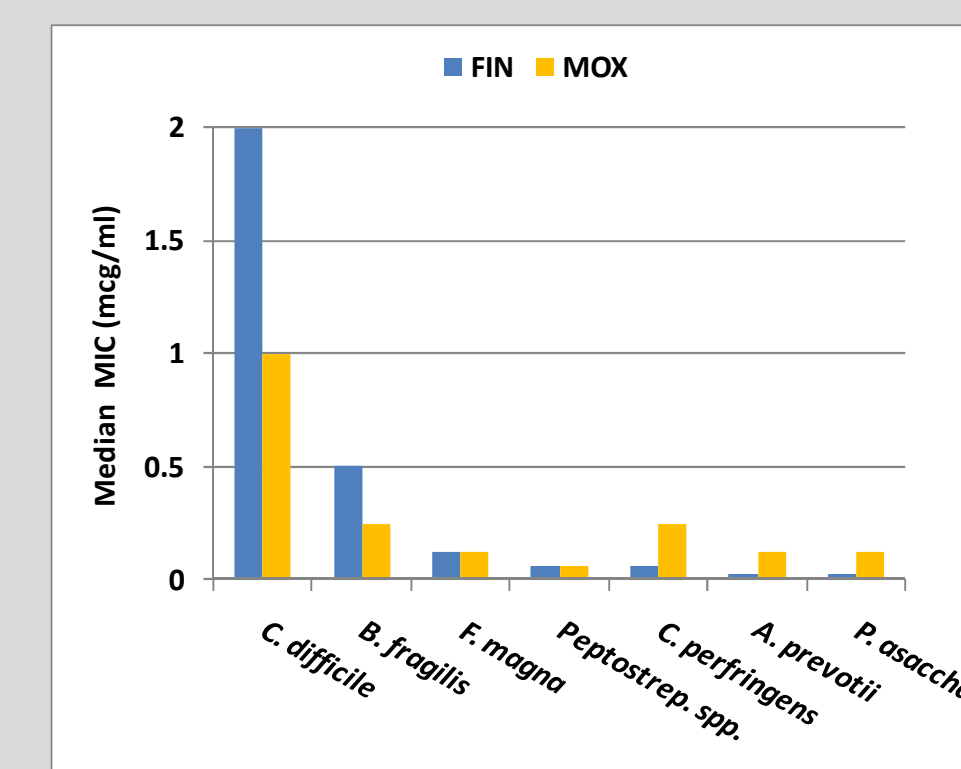
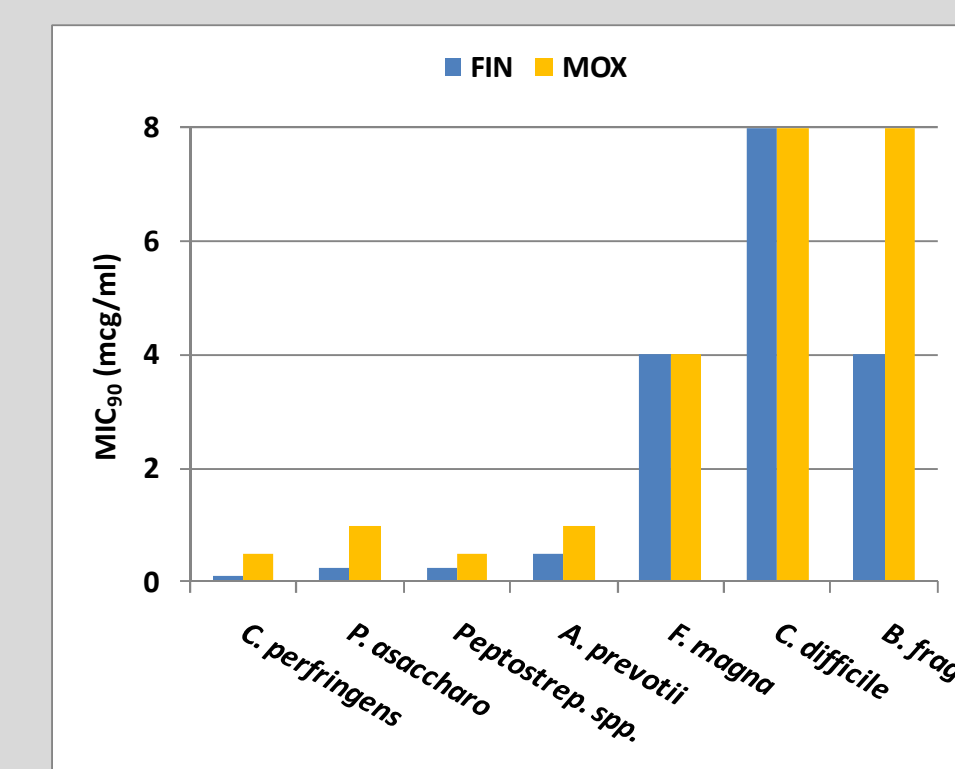


Table 2. Comparison of the activity of finafloxacin and moxifloxacin against seven anaerobic species by MIC range.

Species (n)	Drug	Min	Max
<i>Anaerococcus prevotii</i> (6)	FIN	≤.015	0.5
	MOX	0.03	1
<i>Bacteroides fragilis</i> group (108)	FIN	0.06	8
	MOX	0.12	16
<i>Clostridium difficile</i> (27)	FIN	0.06	8
	MOX	0.5	16
<i>Clostridium perfringens</i> (31)	FIN	≤.015	1
	MOX	0.12	1
<i>Finexgoldia magna</i> (11)	FIN	≤.015	8
	MOX	0.03	8
<i>Peptostreptococcus</i> spp.(24)	FIN	≤.015	4
	MOX	≤.015	4
<i>Peptoniphilus asaccharolyticus</i> (9)	FIN	≤.015	0.25
	MOX	0.06	1

Values shown are MICs expressed in mcg/ml.

Figure 3. Comparison of the activity of finafloxacin and moxifloxacin against seven anaerobic species by MIC₉₀.



Conclusions

- Against the seven different anaerobic species, finafloxacin was generally 1 to 2 doubling dilutions more active than moxifloxacin by MIC₉₀.
- Analyses of means showed that finafloxacin was generally more active than moxifloxacin, while median MIC values were similar for both drugs.
- MIC ranges for both drugs were similar in terms of numbers of dilutions though minimum and maximum MIC values for finafloxacin were generally lower than those for moxifloxacin.
- Further studies with larger numbers of clinical isolates and other species are warranted to further characterize the anti-anaerobic activity of finafloxacin.