Finafloxacin Exhibits Enhanced Activity Under Acidic And Anaerobic Conditions
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Background and aim
Finafloxacin (FIN) is a novel fluoroquinolone that exhibits improved antibacterial and pharmacodynamic properties at pH values below neutral whichPrefers to be characteristic infection sites. Deep seated and chronic infection sites e.g., intraperitoneal abdomen and in optic lesions already can be comprised of areas with low oxygen. The aim of this study was to determine the effect of pH and oxygen on the activity of FIN and comparator antibiotics.

Methods
MICs were performed aerobically and anaerobically at pH 7.2, 6.2 and 5.2 against 176 clinical isolates.

Results
Comparative aerobic and anaerobic median MICs (MIC₅₀) are shown in the Table. The activity of tobramycin (TMB) decreased under anaerobic conditions whereas FIN activity was increased, pH readings confirmed this effect was not due to changes in pH during incubation. Under anaerobic conditions, FIN activity increased by a factor of 3-6 at pH 6.2 compared to pH 7.2. Conversely, the activity of ciprofloxacin (CIP), levofloxacin (LVX), moxifloxacin (MFX) and TOB were decreased by a factor of 3-10 in the acidic media. Meropenem (MEM) and ceftazidime (CAZ) activity was not affected by pH.

Under anaerobic and low pH conditions, the activity of FIN was similar to pH 7.2 (anaerobic), CIP, LVX, MFX and TOB, an expected decreased activity of lower pH, compared to pH 7.2, under anaerobic conditions.

Conclusions
These data highlight the impact of environmental conditions on antibiotic activity, and that pH and oxygen are important parameters. FIN demonstrated enhanced activity under both acidic and anaerobic conditions.

References

Conclusions
These data suggest that finafloxacin could exhibit greater antibacterial and bactericidal activity at infection sites with low pH or oxygen availability, than would be predicted from its MIC (at pH 7.2), whereas other fluoroquinolones and tobramycin could exhibit worse than expected activities.