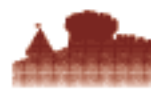


# P1145 Comparative Activity of "Old" and New Quinolones Against Nosocomial *Staphylococcus aureus*

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## ABSTRACT

**Objectives:** To compare *in vitro* activity of an "old" quinolone - ciprofloxacin (CIP), which is known to have a deficient activity against gram-positive bacteria with new quinolones - levofloxacin (LEV) and moxifloxacin (MOX), which combine good gram-negative activity with enhanced gram-positive activity.

**Methods:** Overall, 140 *S. aureus* isolates obtained from hospitalised patients in Smolensk (Russia) were studied. MICs of CIP, LEV, MOX and Oxacillin (OXA) were determined by agar dilution method. Interpretation of results for OXA, CIP and LEV were performed according to NCCLS recommendations (2002). Intermediately resistant and resistant strains were considered as non-susceptible. The *S. aureus* ATCC 29213 was used as a control strain.

**Results:** Among 140 isolates tested, 77 (55%) were methicillin-resistant (MRSA). MOX was the most active agent with MIC<sub>50</sub>=0.125 mg/l compare to 0.5 mg/l for CIP and LEV. The MIC<sub>50</sub>, MIC<sub>90</sub> and MICs ranges are shown in the table 1. The MICs of tested quinolones for methicillin-susceptible strains (MSSA) and MRSA were the same with the exception of MIC<sub>50</sub> for MOX - 0.125 mg/l for MSSA and 0.06 mg/l for MRSA.

Against ciprofloxacin-susceptible MRSA the following MIC<sub>50</sub> (MICs ranges) were observed: 0.5 (0.125-0.5) for CIP, 0.25 (0.125-0.5) for LEV and 0.06 (0.03-0.06) for MOX. Against non-susceptible to CIP MRSA strains (10.4%) MIC<sub>50</sub> (MICs ranges) were: 1 (0.5-4) for LEV and 0.25 (0.125-2) for MOX. Among all isolates only one strain was intermediately resistant to LEV (MIC=4 mg/l), resistant to CIP (MIC=16 mg/l) and had MIC=2 mg/l for MOX.

**Conclusions:** According to the above data MOX is a potent agent against both methicillin-susceptible and methicillin-resistant *S. aureus*. MOX was more active than CIP and LEV. MIC<sub>50</sub> to CIP and LEV were the same. However, MOX and LEV have a reduced activity against non-susceptible to CIP MRSA isolates.

## OBJECTIVES

Methicillin-resistant nosocomial *S. aureus* strains are known to be one of the "problem" nosocomial pathogen in term of their resistance to beta-lactams and other antimicrobial drugs. We performed this study to determine if new quinolones (levofloxacin and moxifloxacin) have sufficient *in vitro* activity against this pathogen.

## METHODS

**Strains:** A total of 140 clinical strains of *S. aureus* isolated in 2000-2001 from patients hospitalized in Smolensk Regional Hospital (Russia) were included in the study. The strains were identified using cultural growth test on mannitol-salt agar and tube coagulase test.

**Susceptibility testing:** Oxacillin-resistance was identified by agar-screening test. Minimal inhibitory concentrations (MICs) of ciprofloxacin (CIP), levofloxacin (LEV) and moxifloxacin (MOX) were determined by agar dilution method in Mueller-Hinton II agar (BBL, USA). Interpretation of results for oxacillin (OXA), CIP and LEV were performed according to the NCCLS recommendations (2002). Intermediately resistant and resistant strains were considered as non-susceptible.

**Quality control:** *S. aureus* ATCC 29213 was used as the reference strain.

## RESULTS

Among 140 isolates tested, 77 (55%) were methicillin-resistant (MRSA). MOX was the most active agent with MIC<sub>50</sub> =0.125 mg/l compare to 0.5 mg/l for CIP and LEV. The MIC<sub>50</sub>, MIC<sub>90</sub> and MICs ranges are shown in the table 1. The MICs of tested quinolones for methicillin-susceptible strains (MSSA) and MRSA were similar. Activity of LEV and MOX against ciprofloxacin-susceptible and ciprofloxacin-nonsusceptible MRSA is shown in the table 2.

Among all isolates only one strain was intermediately resistant to LEV (MIC=4 mg/l), resistant to CIP (MIC=16 mg/l) and had MIC=2 mg/l for MOX.

Table 1. *In vitro* activity of CIP, LEV and MOX against *S. aureus*

Antimicrobials	MIC <sub>50</sub> (mg/l)	MIC <sub>90</sub> (mg/l)	MIC range (mg/l)
MSSA (N=63)			
Ciprofloxacin	0.5	0.5	0.25-1
Levofloxacin	0.25	0.5	0.125-0.5
Moxifloxacin	0.06	0.125	0.03-0.25
MRSA (N=77)			
Ciprofloxacin	0.5	0.5	0.25-16
Levofloxacin	0.25	0.5	0.125-4
Moxifloxacin	0.06	0.06	0.03-2

Table 2. *In vitro* activity of CIP, LEV and MOX against MRSA

Antimicrobials	MIC <sub>50</sub> (mg/l)	MIC <sub>90</sub> (mg/l)	MIC range (mg/l)
Ciprofloxacin-susceptible (N=69)			
Ciprofloxacin	0.5	0.5	0.125-0.5
Levofloxacin	0.25	0.25	0.125-0.5
Moxifloxacin	0.06	0.06	0.03-0.06
Ciprofloxacin-nonsusceptible (N=8)			
Levofloxacin	0.5	1	0.5-4
Moxifloxacin	0.25	0.25	0.125-2

## CONCLUSIONS

- > Moxifloxacin has showed good activity against both methicillin-susceptible and methicillin-resistant *S. aureus* and it is more active than ciprofloxacin and levofloxacin.
- > Moxifloxacin and levofloxacin have a reduced activity against non-susceptible to ciprofloxacin MRSA isolates, so further investigations are needed to estimate their clinical potential in staphylococcal infections, caused by these strains.