

### Potential role of Moxifloxacin in Methicillin-Resistant *Staphylococcus aureus* (MRSA) Infections

Madam, *Staphylococcus aureus* is the commonest isolate in clinical practice. Over the years it has acquired resistance to almost all the available antimicrobials and emergence of multi-drug resistant methicillin-resistant *Staphylococcus aureus* (MRSA) has been especially troublesome. MRSA now accounts for a major proportion of *Staphylococcus aureus* infections worldwide. The antimicrobials of choice for treatment of MRSA infections are the glycopeptides, vancomycin and teicoplanin.<sup>1</sup> These drugs however are expensive, carry significant side effects, and their uncontrolled use can lead to development of resistance against them. Indeed, such resistance is now being increasingly reported from all over the world.<sup>1,2</sup> This has led to the search for other drugs for treatment of MRSA infections. Several new drugs have been introduced recently including quinupristin-dalfopristin, the oxazolidinones and the fourth generation quinolones such as moxifloxacin. We retrospectively studied the in vitro efficacy of moxifloxacin against clinical isolates of MRSA.

According to our computerized database, the frequency of MRSA among all nosocomial isolates of *Staphylococcus aureus* at the Armed Forces Institute of Pathology (AFIP), Rawalpindi was 51% (516/1018) in the first nine months of 2003. Most of the MRSA isolates were from pus and pus swabs (n=394), while the rest were from blood (n=37), intravenous catheter tips and surgical drainage tubes (n=31), various body fluid (n=19), respiratory specimens (n=18) and others (n=17).

Antimicrobial susceptibility of the isolates was tested by the modified Kirby-Bauer disk diffusion technique and results were interpreted according to the National Committee for Clinical Laboratory Standards (NCCLS) criteria.<sup>3</sup> Susceptibility to moxifloxacin was tested by using 5µg moxifloxacin disk (Oxoid) on Mueller-Hinton agar incubated at 37°C overnight while methicillin-resistance was tested by using 1 µg oxacillin disk (Oxoid) on Mueller-Hinton agar containing 4% sodium chloride incubated at 33°C for 24 hours. Our results were quite encouraging: 444 isolates (86%) were susceptible to moxifloxacin while 72

(14%) were resistant.

The latest generation of fluoroquinolones like moxifloxacin, an 8-methoxyfluoroquinolone have broad antibacterial activity against both Gram-positive and Gram-negative organisms. They have enhanced bactericidal activity as well as decreased cross-resistance with other quinolones. Moxifloxacin is now being recommended for use against Gram-positive pathogens especially *Streptococcus pneumoniae*.<sup>4</sup> However its role against *Staphylococcus aureus* has not been properly evaluated although data suggests that it has good in vitro as well as in vivo activity against MRSA with a low propensity to select for resistance.<sup>5</sup>

Our data has shown excellent in vitro activity of moxifloxacin against MRSA. However a resistance rate of 14% despite the drug's recent introduction is worrisome. It is yet to be seen if drug resistance in moxifloxacin would spread as rapidly as in other quinolones. The drug might have a useful role in selected cases of MRSA infections such as patients with renal insufficiency. If its efficacy in vivo is validated by clinical trials, then with its lesser side effects, moxifloxacin might be a cost-effective alternative to vancomycin in MRSA infections.

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