

# Statins May Offer Protective Effect Against MRSA

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CHICAGO — Statins have antimicrobial effects in vitro, including against methicillin-resistant *Staphylococcus aureus*, according to data presented at the annual Interscience Conference on Antimicrobial Agents and Chemotherapy.

The drug concentrations needed to produce bacterial suppression in vitro were several log values higher than those typically found in blood samples from patients taking statins for their cholesterol-lowering or cardiovascular effects. The findings imply, however, that the structure of statins could be altered to enhance their antimicrobial effect, reported Dr. Jon Cohen, professor of infectious diseases and dean of the Brighton and Sussex Medical School, in Brighton, England.

Simvastatin (Zocor, Merck & Co.) had a more potent in vitro antimicrobial effect

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than did fluvastatin (Lescol, Novartis) against methicillin-sensitive *S. aureus* (MSSA). Activity also was seen, but to a lesser extent, against methicillin-resistant *S. aureus* (MRSA). Statins have immunomodulatory effects and recent observational studies have suggested that the use of statins may be associated with a decreased risk of severe infections, including sepsis and pneumonia.

Dr. Cohen and coinvestigator Dr. Susie Jerwood, of the Royal Sussex County Hospital, Brighton, theorized that statins also may exert antimicrobial effects.

Using a standard microtiter dilution method, the researchers tested simvastatin and fluvastatin against six samples each of MSSA and MRSA, as well as six samples each of vancomycin-sensitive and -resistant enterococci, isolated from blood cultures. The drugs were obtained in pure form from the manufacturers, Merck and Novartis. The control drug was propranolol.

The highest dilution at which there was no visible growth of bacteria after overnight incubation (the minimum inhibitory concentration [MIC]) was recorded. Each drug was tested against each of the isolates in duplicate on each culture plate. The tests then were repeated.

The average MIC for simvastatin was

29.2 mg/L against MSSA and 74.9 mg/L against MRSA. Fluvastatin had significantly less effect. The control drug, propranolol, showed no antimicrobial effect. Dr. Cohen did not provide MIC data on fluvastatin at the meeting.

“Unquestionably, there is an antimicrobial effect here, and it is specific,” Dr. Cohen told reporters in a press briefing at the meeting, sponsored by the American Society for Microbiology. “The second point, though, is that the effect that we demon-

strated is modest. You’d need quite a lot of statin in order to produce any antimicrobial effect.” The typical peak plasma concentration of simvastatin attained after a 40-mg oral dose is 0.0209 mg/L.

Thus, it’s unlikely that the antimicrobial effects of statins are directly responsible for the protective benefits observed in previous trials, Dr. Cohen said. However, statins are broken down in the blood to active metabolites that could have greater antibacterial activity than the pure drug.

The findings “might point the way to a class effect,” he said. “There is something about the chemical structure of these drugs that indeed does have antimicrobial activity.”

“It’s quite interesting that there is a difference between simvastatin and fluvastatin, suggesting that there are chemical differences between the drugs and that some of those differences might locate where in the molecule the activity is,” Dr. Cohen added. ■



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