Linezolid-Resistant MRSA Outbreak Reported

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WASHINGTON — An outbreak of methicillin-resistant *Staphylococcus aureus* in a Spanish hospital may be the first reported appearance of a linezolid-resistant strain of the organism.

Between April and June of this year, 12 patients in an intensive care unit at the Hospital Clinico San Carlos in Madrid were identified as having methicillin-resistant *Staphylococcus aureus* (MRSA) that was also resistant to linezolid (Zyvox). Dr. Miguel Sanchez, an internist at the hospital, reported the outbreak during a press briefing at the jointly held annual Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) and the annual meeting of the Infectious Diseases Society of America (IDSA).

Linezolid-resistant MRSA was identified during surveillance and/or diagnostic culture from eight men and four women in the ICU—eight patients were critically ill, three were surgical cases, and one was a trauma patient. LR-MRSA caused infection in 11 patients—5 with ventilator-associated pneumonia, 5 with primary bacteremia, and 1 with catheter-related sepsis.

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Patients had a mean ICU stay of roughly a month (34 days) before the index culture. At the index culture, all patients were intubated, had been on prolonged broad-spectrum antibiotic therapy, and had concomitant linezolid-susceptible MRSA. Eleven of the patients had received intravenous linezolid, one of the oxazolidinone class of antibiotics.

Hospital staff members were able to quickly control the outbreak by stepping up routine surveillance and isolating these patients. Patients identified with LR-MRSA were sampled once a week at three different sites.

Surveillance of the environment and staff also was performed. Only 1 of 91 environmental surface samples tested positive for LR-MRSA.

This sample was from an intravenous catheter connection. The hands of health care personnel also were sampled, and none was positive for LR-MRSA. Genotyping revealed that one clone was responsible for 10 infections.

As a result of the outbreak, hospital personnel reviewed their antibiotic use. Subsequent use of linezolid was limited to either documented or suspected cases of respiratory tract MRSA infections.

As a result, use of linezolid at the hospital dropped from 202 defined daily doses in April to 25 in July. The LR-MRSA was susceptible to vancomycin, daptomycin (Cubicin), and tigecycline (Tygacil), which were used to treat these patients. For comparison, the minimum inhibitory concentration was greater than 8 mg/L for linezolid but less than 0.32 mg/L for tigecycline and daptomycin.

"Linezolid is a relatively new drug," noted Dr. Robert S. Daum, a pediatric infectious diseases specialist at the University of Chicago who spoke at the press conference but was not involved with the Spanish outbreak. "In general, resistance has been very infrequent. We've seen some in Chicago … but it's actually quite rare in this country."

He attributed this to antibiotic stewardship programs at many U.S. hospitals. "In our hospital, we have a very tight grip on linezolid use."

The drug can be prescribed only with the approval of an infectious disease specialist.

Limiting use of the drug limits the chances for an organism to develop resistance to it.

Dr. Sanchez agreed, noting that "the take-home message for us is that we have to find ways to administer antibiotics prudently. … We also have to find ways to shorten antibiotic courses."

Dr. Sanchez and his colleagues are planning a case-control study to investigate the means of LR-MRSA transmission.

Dr. Sanchez did not report whether he had any conflicts of interest. ■