against methicillin-resistant Staphylococcus aureus (MRSA) including those with reduced susceptibility to teicoplanin or vancomycin. A randomized comparative study of the use of linezolid and teicoplanin in critically ill patients showed no difference in efficacy.\(^1\) A significant difference was, however, noted in the clearance of MRSA from the skin.\(^1\)

At the start of treatment, 45 linezolid- and 43 teicoplanin-treated patients were colonized with MRSA. By the end of treatment, 23 (51\%) patients receiving linezolid and 8 (19\%) patients receiving teicoplanin had cleared MRSA carriage \((P = 0.002)\). Although re-colonization occurred in a few cases, the use of linezolid reduced the risk of transmission of MRSA within the intensive care unit for 1–2 weeks after completion of treatment. To determine the effect of linezolid and teicoplanin on the detection of staphylococci in skin flora, a study was conducted using contact plates applied to the patient’s skin during treatment.

The study was approved by the University College London Hospitals Ethics Committee (00/0029). Mannitol salt agar (without oxacillin) contact plates \((6 \text{ cm diameter}, \sim 28.25 \text{ cm}^2)\) were used to monitor MRSA, methicillin-susceptible \(S. \text{ aureus}\) (MSSA) and coagulase-negative staphylococci on the skin of patients receiving either teicoplanin or linezolid. The antibiotics were given as part of the main trial published previously\(^1\) in a blinded fashion: teicoplanin 6 mg/kg daily intravenous \((iv)\) or linezolid 600 mg twice daily \((iv)\). Sampling was performed at the same time each day before administering the antibiotic on days 0, 1, 2, 3, 5 and 7. After first reaching room temperature, agar was pressed to the inner, fleshy part of the patient’s knees (separate plates). Plates were incubated at 37°C for 48 h, at which time the numbers of each type of staphylococcus were categorized as none, light \((1–50 \text{ cfu})\), medium \((51–500 \text{ cfu})\) and heavy \((>500 \text{ cfu})\). Five colonies of each type were tested by standard methods to distinguish \(S. \text{ aureus}\) and coagulase-negative staphylococci.

Growth of MRSA was in the same category (none, light, medium or heavy) for at least 4 of the sampling days in 44 (85\%) of 52 samples in 26 patients treated with teicoplanin and 37 (88\%) of 42 samples in 21 patients treated with linezolid. Of the 24 MRSA carriers, none of the 9 patients in the linezolid group was positive for MRSA from day 5, compared with 9 of 15 carriers in the teicoplanin group \((\chi^2 \text{ test } P = 0.007)\). A reduction in category for at least 2 consecutive days was recorded in six (12\%) samples in four patients given teicoplanin and in eight (19\%) samples in five patients given linezolid. A rise in category was recorded in two patients treated with teicoplanin. MSSA was only isolated from the skin of two patients.

Coagulase-negative staphylococci were isolated from all patients. The average category in the first and last 3 days of sampling fell in 27 (52\%) of 52 samples in the teicoplanin group versus 31 (76\%) of 41 in the linezolid group \((\chi^2 \text{ test } P < 0.05)\). Sample growth was in the same category for at least 4 sampling days in 24 (46\%) cases in the teicoplanin group and 20 cases (49\%) in the linezolid group. Sampling the skin daily for 5 days in two cases not given antibiotics showed no significant trend over time in the numbers of coagulase-negative staphylococci retrieved.

After 3 days of treatment, linezolid was more effective than teicoplanin in eradicating MRSA from the skin and in reducing the load of coagulase-negative staphylococci. Unlike teicoplanin, linezolid is highly concentrated in the skin and soft tissues, sufficient to exceed the MIC for most Gram-positive bacteria.\(^2,3\) Therefore, not only is linezolid capable of clearing MRSA carriage from some patients as demonstrated in the main trial,\(^1\) but also it could reduce the rate of transmission of MRSA and potentially reduce rates of wound and line infection by coagulase-negative staphylococci. Others have found linezolid effective in eradicating carriage in critical care patients, but used it in combination with topical agents.\(^4\) Linezolid is expensive and MRSA can develop resistance,\(^5\) but this property might usefully be further investigated when treating infections in wards with a high level of endemic MRSA or potentially to decontaminate high-risk patients when topical treatment has failed, e.g. prior to major surgery.

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Transparency declarations

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References

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