Susceptibility of MRSA to triclosan

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Sir,

Triclosan (2,4,4′-trichloro-2′-hydroxydiphenyl ether) is a broad-spectrum biocide that has been used for more than 30 years and can be found in a variety of household items, including toothpastes, cosmetics, antiseptic soaps, carpets, toys, floor cleaners, dishwashing detergents and even chopsticks.1,2 More recently it has been used in the clinical setting as part of a regimen for decolonizing patients with methicillin-resistant Staphylococcus aureus (MRSA).1,3 Triclosan acts on a range of cytoplasmic membrane and intracellular target sites. Increased resistance to triclosan has recently been attributed to an alteration in the fabI gene coding for enoyl reductase.1 Although patient non-compliance with the decolonizing regimen may be responsible for failure to eradicate MRSA, it is also possible that increased resistance to triclosan may contribute. In a recent study of a small number of clinical MRSA isolates, a triclosan MIC range of 0.025–1 mg/L was reported, whereas in an earlier study, MICs of 2–4 mg/L were reported for MRSA.4

We studied 232 clinical MRSA isolates referred to the Scottish MRSA Reference Laboratory from 30 Scottish hospitals between 1997 and 2000. The isolates were characterized by phenotypic and genotypic methods and included 14 different clones,5 the majority of which were EMRSA-15 (72) and EMRSA-16 (73). Triclosan (Irgasan, Ciba, UK) MIC determination was based on NCCLS methodology.6 Briefly, 107 cfu/mL were seeded on to Mueller–Hinton-II agar (Beckton Dickinson, UK) containing triclosan (0.015–64 mg/L) and incubated at 37°C for 48 h. S. aureus (NCTC 12973) and Staphylococcus hominis (NCTC 11320) were used as low and high controls, respectively.

For all tested MRSA, the triclosan MIC50 was 0.03 mg/L and MIC90 was 0.06 mg/L (range ≤0.015–4 mg/L). EMRSA-15 and EMRSA-16, which account for 70% and 26% of Scottish MRSA, respectively, both had a triclosan MIC50 of 0.03 mg/L but MIC90 of 0.06 mg/L (≤0.015–0.25 mg/L) and 0.03 mg/L (≤0.015–0.25 mg/L), respectively. Three SMRSA-99 (Scottish MRSA type 99) isolates, also known as the Iberian clone, two SMRSA-117 isolates and five sporadic isolates had triclosan MICs of 1–4 mg/L.

This study does not support the contention that the widespread use of triclosan in various products will select for resistance in MRSA. It is significant that the two dominant UK epidemic strains (EMRSA-15 and EMRSA-16) were particularly susceptible to triclosan and this should encourage its use in decolonization regimes. However, our finding that some MRSA clones may have reduced susceptibility to triclosan highlights the need to be aware of such MRSA clones.

References
