Increased CD49b+ mice. The vitamin E of the leucocyte populations in comparison with control infected animals. Daptomycin alone did not change any mRNA of induced significant up-regulation of both fibronectin and IL-24 by quantitative PCR on day 8 after infection. Vitamin E treatment either fibronectin type III or interleukin-24 (IL-24) was evaluated daptomycin was associated with better tissue repair, mRNA for excised tissues was found in mice receiving vitamin E plus daptomycin, in which there was a 4 log reduction in count (2.0 × 10^5 cfu/mL, ANOVA, P < 0.001). Groups treated either with vitamin E or daptomycin alone showed a 2 or 3 log reduction in counts (3.2 × 10^5 ± 1.1 × 10^5 or 8.5 × 10^5 ± 2.3 × 10^5 cfu/mL, respectively). The most significant reduction in quantitative cultures of excised tissues was found in mice receiving vitamin E plus daptomycin, in which there was a 4 log reduction in count (2.0 × 10^5 ± 0.3 × 10^5 cfu/mL, ANOVA, P < 0.001). In order to evaluate whether the antimicrobial effect of vitamin E and/or daptomycin was associated with better tissue repair, mRNA for either fibronectin type III or interleukin-24 (IL-24) was evaluated by quantitative PCR on day 8 after infection. Vitamin E treatment induced significant up-regulation of both fibronectin and IL-24 mRNA of 2-fold (3.6- and 3.7-fold, respectively) compared with untreated-infected mice (P = 0.01; Figure 1). The vitamin E + daptomycin combination significantly increased both fibronectin and IL-24 expression compared with control infected animals: increases of 2.3-fold (P = 0.05) and 2.9-fold (P = 0.02), respectively. However, daptomycin alone did not modify marker expression compared with infected animals.

The antimicrobial effect of vitamin E alone or with daptomycin was associated with immune modulation. In mice treated with vitamin E the percentage of both Gr-1+ cells (P = 0.03) and CD49b+ cells (P = 0.04) was increased in comparison with control infected animals. Daptomycin alone did not change any of the leucocyte populations in comparison with control infected mice. The vitamin E + daptomycin combination significantly increased CD49b+ cells compared with mice treated with vitamin E alone (P = 0.03) or control infected animals (P = 0.002).

In conclusion, this study demonstrates that vitamin E displays potential antimicrobial benefit with respect to MRSA both by itself and when used in combination with daptomycin. The significant bacterial inhibition occurring in animals treated with either vitamin E alone or vitamin E + daptomycin was associated with increased markers of tissue repair and immunological changes. Future studies will be required to evaluate the potential use of vitamin E as an enhancer of antibiotic therapy in humans, especially for the management of infected wounds, particularly in those populations who are at greater risk of inadequate dietary intake of vitamin E, such as elderly subjects.

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Transparency declarations
None to declare.

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Long-term carriage of NDM-1-producing Escherichia coli

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Figure 1. Effect of in vivo treatment with vitamin E (VE) and/or daptomycin on markers of tissue repair. Old BALB/c mice were treated with VE and/or daptomycin and analysed for fibronectin and IL-24 mRNA levels by quantitative real-time PCR. Data are reported as means ± SD and are cumulative of two different experiments. Differences in fibronectin and IL-24 mRNA expression were evaluated by ANOVA followed by the Student–Newman–Keuls post hoc test when appropriate.
Sir,

The carbapenemase NDM-1 was initially identified in Escherichia coli and Klebsiella pneumoniae in 2009, and subsequently in many enterobacterial species worldwide, predominantly from patients hospitalized in India, Pakistan and Bangladesh. While most reports to date have indicated nosocomial acquisition of NDM-1 producers, we have also reported community acquisition of an NDM-1 producer. This case involved a patient who, when hospitalized in France in early 2010, was found to be colonized on her skin by an NDM-1-producing Escherichia coli. Although the patient had been living in Darjeeling, India, there was no prior history of hospitalization in that country. The source of colonization of this patient was not identified, but recent reports have demonstrated the extensive isolation of NDM-1 from tap and environmental water in New Delhi, leading us to speculate that exposure to contaminated water may account for this case.

We report here on the long-term follow-up of this patient over a period of 13 months, from initial hospitalization until her death. Screening of this patient using rectal swabs plated on selective culture medium (ChromID ESBL, bioMérieux, La-Balme-Les-Grottes, France), as described previously, yielded regular positive samples. The patient had received two courses of antibiotics comprising co-amoxiclav (3 g daily) for 10 days at the time of identification of the colonization in March 2010 and then gentamicin (250 mg daily) in an attempt to treat a urinary tract infection just prior to her demise. In our view, those courses of antibiotic treatment are unlikely to have generated sufficient selective pressure to account for the persistence of the NDM-1-positive E. coli in the intestinal flora of the patient for >1 year. Indeed, such long-term persistence of E. coli in the environment and in the intestinal flora is already known. Interestingly, the NDM-1-positive E. coli isolated from this patient was of the ST131 type, which is of the sequence type mainly associated with the dissemination of the prevalent clavulanic acid-inhibited extended-spectrum β-lactamase CTX-M-15 worldwide.

The case we report here indicates the long-term persistence of NDM-1-positive bacteria in the intestinal flora. This sustained level of carriage may be considered as a further risk factor for the dissemination of NDM-1 producers, taking into account that up to 10^7 E. coli per gram of faeces are commonly found in humans. This observation also further underlines the urgent need to screen for carriers worldwide and the fact that colonized patients should be kept in strict isolation during their entire hospital stay.

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Successful treatment of methicillin-resistant Staphylococcus aureus mitral valve endocarditis with sequential linezolid and telavancin monotherapy following daptomycin failure

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