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LETTER TO THE EDITOR

Occurrence of methicillin-resistant *Staphylococcus aureus* in the nasal cavity of healthy volunteer students of the University of Valencia (Spain)



Dear Editor,

Staphylococcus aureus is a human pathogen that causes both hospital- and community-acquired infections, resulting in a plethora of diseases. Hospitalized patients are particularly exposed to nosocomial infections by *S. aureus* due to their compromised immune system and the frequent use of clinical devices, which favor *S. aureus* infections.^{1,2} In addition, *S. aureus* is a commensal microorganism; it is often found in skin, skin glands, and mucous membranes, particularly in the nose of healthy individuals. These healthy carriers constitute a reservoir of the pathogen; colonization significantly increases the risk of infection when host defenses are compromised and patients are frequently infected with the same strain they carry as a commensal.³ The clinical importance of *S. aureus* is enhanced by its remarkable potential to develop antimicrobial resistance, with the acquisition of resistance to methicillin being the most notable concern. Over the last decades, methicillin-resistant *S. aureus* (MRSA) strains have been gradually disseminated, causing serious hospital infections worldwide, and leading to a situation in which MRSA infections have a higher frequency than methicillin-susceptible *S. aureus* in some settings.² Resistance develops by acquiring the *mecA* gene carried on a large mobile genetic element (*Staphylococcus* Cassette Chromosome (SCC) *mec*), which confers resistance to all β -lactam antibiotics. Historically, hospital-acquired MRSA infections were caused by internationally dispersed clones. At present, community-acquired MRSA is emerging all over the world, although not much is known about its transmissibility.^{2,4,5}

We have studied the incidence of nasal carriage of MRSA in young healthy adults in order to determine the spread of

MRSA in the community, that is outside the hospital environment. The study was performed in 203 volunteers (22–32 years old) among the students of the Faculty of Pharmacy (University of Valencia) during the 2010–2011 and 2011–2012 time periods. A total of 45 isolates were identified as *S. aureus* (based on growth on mannitol salt agar, and immunological and biochemical characterization), indicating that a significant percentage (22%) of the individuals were carriers of *S. aureus*, similar to that described for the general human population (20–30%).³ Interestingly, no resistances to methicillin were found, neither in isolates from male or female individuals. None of the volunteer healthy students participating in the study had been exposed to risk factors for *S. aureus* colonization or antibiotic treatments for at least 2 months prior to their participation in the study. Our results indicate that commensal *S. aureus* isolated from young healthy adults are not resistant to methicillin, probably due to both the absence of selective pressure to select resistances and the lack of the SCC*mec* mobile genetic element, suggesting that genetic mechanisms converting *S. aureus* from the normal human microbiota into MRSA have limited success outside the hospital environment. However, because community-acquired MRSA infections can result in serious consequences and a rapid emergence of community-acquired MRSA has been observed, there is a need to implement continued surveillance of MRSA dissemination in the community in order to maximize MRSA prevention and control.^{2,4,5}

Conflicts of interest

The authors declare that they have no conflicts of interest related to the material discussed in this article.

References

1. Dulong M, Haamann F, Peters C, Schablon A, Nienhaus A. MRSA prevalence in European healthcare settings: a review. *BMC Infect Dis* 2011;11:138–51.
2. Otto M. MRSA virulence and spread. *Cell Microbiol* 2012;14: 1513–21.
3. Weidenmaier C, Goerke C, Wolz C. *Staphylococcus aureus* determinants for nasal colonization. *Trends Microbiol* 2012;20: 243–50.
4. Chambers HF, DeLeo FR. Waves of resistance: *Staphylococcus aureus* in the antibiotic era. *Nat Rev Microbiol* 2009;7:629–41.
5. DeLeo FR, Chambers HF. Reemergence of antibiotic-resistant *Staphylococcus aureus* in the genomic era. *J Clin Invest* 2009; 119:2464–74.

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