

# Prevalence of nasopharyngeal colonization by methicillin-resistant *Staphylococcus aureus* in a population of high school students in Torrelavega (Spain)

## Prevalencia de colonización nasofaríngea por *Staphylococcus aureus* resistente a meticilina en una población de estudiantes de bachillerato en Torrelavega (España)

Dear Editor:

There is an association between the prevalence of carriers of methicillin-resistant *Staphylococcus aureus* (SA, MRSA) in a human population and the occurrence of infectious complications.<sup>1</sup> Therefore, information regarding the prevalence of colonization in a population with little contact with health care services can help to elaborate recommendations for the treatment of community-acquired infections.

For this purpose, we designed a cross-sectional study of microbiological sampling and epidemiological interviewing of a series of unselected high school students (all those attending higher grade) in an urban community in Northern Spain. Samples consisted of swabs of nasal and pharyngeal secretions, which were immediately inoculated in blood agar, chocolate agar and in a specific MRSA-medium (Brilliance MRSA, Oxoid, Basingstoke, UK). We processed and identified SA and MRSA according to standard microbiological criteria and we confirmed methicillin-resistance by disk-diffusion on agar with cefoxitin (30 µg). The interview included demographics (including number of persons living in the home and their eventual visits, if any, to health-care services), past medical history, and use of tobacco and alcohol. The statistical analysis was a description of the proportion of colonized subjects, followed by ascertainment of possible associations between epidemiological variables and microbiological results by means of Mann–Whitney's *U* test for quantitative variables and  $\chi^2$  tests for qualitative variables. All participants gave their written informed consent, and the study was approved by the Ethics Committee for Clinical Investigation of Cantabria.

Out of 120 screened students, 102 (50 men and 52 women) were present on the appointed date and participated in the study. Their ages ranged between 16 and 19 years (median: 17). Fourteen (13.7%) declared themselves as smokers, with a median 6.7 cigarettes per day. Twenty-five (24.5%) drank any alcohol, with a median consumption of 4.7 standard units per week. Fourteen samples were positive for SA (13.7%, 95%CI: 6.5–20.9). We found no association between isolation of SA and any sociodemographic variable. Six isolates (42.9%, 95% CI: 17.7–71.1) were methicillin-resistant.

Over 40% of staphylococci isolated from our healthy population, with null or minimal contact with health care system, were methicillin-resistant. The epidemiology of MRSA has generated increasing levels of interest ever since the first isolation of resistant strains in the 1960s. However, an overwhelming majority of published reports focus on well-defined populations because of a particular disease or contact with health services. With this limitation in mind, the range of reported prevalence rates of nasal colonization by MRSA is very wide. In a study in an emergency room in Boston 39% of 400 attendees were colonized by

methicillin-sensitive SA while 5% were colonized by MRSA (MRSA represented 11% of all SA).<sup>2</sup> Samples taken from skin and ocular membranes of patients undergoing cataract surgery in Salt Lake City (expected to be representative of elderly general population) showed prevalence rates of colonization of 16% and 6.5% respectively for methicillin-sensitive and resistant SA.<sup>3</sup> In recent years a number of studies have addressed the issue of colonization in healthy children and adults, reporting rates of nasal carriage of SA between 14 and 33%, of which 6–43% were MRSA.<sup>4–7</sup> These reports represent a wide range of geographic sites and social contexts (university, primary school, general population), and none provide systematic data about possible associations between epidemiologic variables and the carrier-state. In addition to its small sample size, our study has some limitations that should be accounted for. They include the restricted number of epidemiological variables and the lack of molecular diagnosis, which is not available at our laboratory and was not planned in the initial study design. From our results we want to highlight the high proportion of MRSA among SA isolates in our healthy group of students with minimal or null contact with health care services. In other words, almost half the strains of SA currently circulating in our community are likely to be MRSA. This information can be of interest when considering the empiric treatment of infections in which SA is a common etiologic agent, and in which beta-lactam antibiotics may presently not be the first choice.

## Bibliografía

1. Huan SS, Hinrichsen VL, Datta R, Spurchise L, Miroshnik I, Nelson K, et al. Methicillin-resistant *Staphylococcus aureus* infection and hospitalization in high-risk patients in the year following detection. *PLoS ONE*. 2011;6:e24340.
2. Schechter-Perkins EM, Mitchell PM, Murrey KA, Rubin-Smith JE, Weir S, Gupta K. Prevalence and predictors of nasal and extranasal staphylococcal colonization in patients presenting to the emergency department. *Ann Emerg Med*. 2011;57:492–9.
3. Olson R, Donnenfeld E, Bucci FA, Price FW, Raizman M, Solomon K, et al. Methicillin resistance of *Staphylococcus* species among health care and non-health care workers undergoing cataract surgery. *Clin Ophthalmol*. 2010;4:1505–14.
4. Castro-Orozco R, Villafañe-Ferrer LM, Alvarez-Rivera E, De Arco MM, Rambaut-Donado CL, Vitola-Heins GV. *Staphylococcus aureus* metililino resistentes en niños escolares de Cartagena. *Rev Salud Publica (Bogota)*. 2010;12:454–63.
5. Anwar MS, Jaffery G, Rehman Bhatti KU, Tayyib M, Bokhari SR. *Staphylococcus aureus* and MRSA nasal carriage in general population. *J Coll Physicians Surg Pak*. 2004;14:661–4.
6. Gardella N, Murzicato S, Di Gregorio S, Cuirolo A, Desse J, Crudo F, et al. Prevalence and characterization of methicillin-resistant *Staphylococcus aureus* among healthy children in a city of Argentina. *Infect Genet Evol*. 2011;11:1066–71.
7. Kittit T, Boonyonying K, Sitthisak S. Prevalence of methicillin-resistant *Staphylococcus aureus* among university students in Thailand. *Southeast Asian J Trop Med Public Health*. 2011;42:1498–504.

Ramón Teira<sup>a,\*</sup>, Andrea Teira<sup>b</sup>, Ana Belén Campo<sup>a</sup>, Inés de Benito<sup>a</sup>

<sup>a</sup> Service of Internal Medicine, Hospital de Sierrallana, Torrelavega, Spain

<sup>b</sup> Instituto Marqués de Santillana, Torrelavega, Spain

\* Corresponding author.

E-mail address: [ramon.teira@scsalud.es](mailto:ramon.teira@scsalud.es) (R. Teira).

<http://dx.doi.org/10.1016/j.eimc.2012.10.006>