

LETTER TO THE EDITOR

Low Rates of Nasal Colonization With Methicillin-Resistant *Staphylococcus aureus* Among Staff Members of an Italian Hospital

TO THE EDITOR—Although methicillin-resistant *Staphylococcus aureus* (MRSA) usually spreads in hospitals via the hands of staff members,¹ outbreaks caused by colonized healthcare workers (HCWs) have been reported.² Nasal screening of HCWs for MRSA is performed routinely in several countries,^{3,4} typically when more than 1 MRSA-colonized patient is identified in high-risk wards, such as intensive care units (ICUs). Rates of nasal carriage of MRSA among HCWs may vary greatly, from 1%-2% to 6%-8%.^{5,6} We report here data on nasal carriage of MRSA among HCWs in Italy, where, to our knowledge, no data are available to date. Of note, Italy has one of the highest rates of resistance to methicillin (greater than 40%) among nosocomial *S. aureus* isolates.⁷

This study was performed at the Istituti Ospitalieri di Cremona (Cremona, Italy), an 850-bed community facility that has approximately 25,000 patient admissions each year. MRSA has been endemic in the hospital since the early 1990s, and the average rate of recovery of MRSA isolates is 0.5 case per 100 admissions (range, 0.23 case per 100 admissions in the ICU); 34.6% of MRSA-positive patients have an infection due to this pathogen. In 72.4% of cases, the patients acquired MRSA during their hospital stay (ie, more than 48 hours after admission). Finally, the rate of resistance to methicillin among nosocomial *S. aureus* isolates varied from 15% to 50%, depending on the ward and year. Because of the long-lasting endemicity, all screened HCWs had previous close contacts with MRSA-positive patients. No HCW had ever been screened for MRSA before.

The clinical staff at the Istituti Ospitalieri di Cremona consists of 1478 HCWs: 270 medical doctors, 796 nurses, 67 physiotherapists, 192 ancillary staff, and 153 members with other qualifications. Samples were obtained from staff members at the beginning of each work shift; a cellulose swab moisturized with standard solution was inserted into each anterior nostril and was rotated 5-10 times. Programmed screening swab specimens were obtained in the general surgery, hematology, infectious diseases, rehabilitation medicine, ICU, nephrology/hemodialysis, and physical rehabilitation therapy wards. HCWs in a surgical ward and ICU were also screened during outbreaks of MRSA infection (ie, outbreak screening). No HCW was excluded from programmed or outbreak screenings.

Nasal swabs were cultivated on colistin-nalidixic acid agar. Identification of any colonies that grew on the agar was performed by use of an agglutination test using mannitol salt

agar and a multivalent latex system (Staphaurex Plus; Murex). Resistance to methicillin among *S. aureus* strains was tested with BBL Crystal MRSA ID (Becton Dickinson).

Data were collected and analyzed using Epi-Info software (version 6.01; Centers for Disease Control and Prevention). Differences in frequencies were evaluated by means of the χ^2 statistic or Fisher exact test, as appropriate. $P < .05$ was considered to be statistically significant.

We performed nasal screening for 225 (97%) of the 233 HCWs in the participating wards; 8 HCWs refused to participate. The screened staff members represented 15.2% of the 1478 HCWs working in the hospital, and their mean age was 38.6 years (range, 23-62 years). The male-to-female ratio was 0.27. We obtained 286 nasal swab specimens from these 225 HCWs; 61 HCWs underwent screening twice, as programmed and outbreak controls. Two hundred twenty swab specimens were obtained as programmed controls, whereas 66 swab specimens were obtained during MRSA outbreaks.

Four nasal MRSA carriers were identified, with a prevalence of 1.8% (Table). The rates of nasal carriage of MRSA were low, irrespective of ward, category of HCWs, and type of screening (ie, outbreak or programmed). The rate of nasal carriage of methicillin-susceptible *S. aureus* was 30.4%, which was similar to that usually reported in the general population. The rate of resistance to methicillin among all *S. aureus* isolates recovered from the HCWs was 4.9%. Higher rates of methicillin-susceptible *S. aureus* carriage were observed in the ICU (48.1%) and surgical wards (38.1%) than in the infectious diseases (15.8%) and rehabilitation medicine (17%) wards ($P = .03$). Similar rates of methicillin-susceptible *S. aureus* carriage, ranging from 20% to 35.1% ($P = .3$), were observed among the 4 categories of HCWs.

Despite the high rate of resistance to methicillin found in our hospital, we observed rates of MRSA carriage that are consistent with those reported elsewhere (ie, 1%-3%).^{5,6} During epidemics involving single high-risk wards and several hospitals, rates of nasal colonization with MRSA among HCWs have varied from 6%-8% to almost zero.^{8,9} We observed low rates of MRSA carriage, in spite of the high prevalence of MRSA among patients, that possibly are secondary to transient colonization.¹⁰ Notably, in our study, the swab specimens were obtained at the beginning of the shift, which reduced the possibility of identification of transient carriers. Although reasons for persistent and heavy colonization have been reported elsewhere and recently were carefully described by Kniehl et al.,⁴ explanations for the low rate of colonization among staff members, despite a high prevalence of MRSA among patients, such as in the present study, have yet to be clarified, to our knowledge. Furthermore, adherence to proper hand hygiene protocols does not seem to play a protective role against colonization with MRSA, because the rate

TABLE. Isolation of Methicillin-Susceptible *Staphylococcus aureus* (MSSA) and Methicillin-Resistant *S. aureus* (MRSA) from Nasal Swab Samples Obtained From Healthcare Workers (HCWs) at the Istituti Ospitalieri Di Cremona: Analysis by Ward

Ward	No. of HCWs Screened	MSSA Strains, No. (%)	MRSA Strains, No. (%)
Nephrology/hemodialysis	50	9 (18)	1 (2)
Hematology	22	4 (18.2)	0
Rehabilitation medicine	30	8 (26.7)	1 (3.3)
Infectious diseases	19	3 (15.8)	0
Physiotherapy	30	5 (17)	0
Surgery			
Programmed screening	42	16 (38.1)	1 (2.4)
Outbreak screening	45	15 (33.3)	1 (2.2)
Intensive care unit			
Programmed screening	27	13 (48.1)	0
Outbreak screening	21	9 (42.9)	0
Total	225 ^a	68 (30.2) ^b	4 (1.8) ^c

NOTE. No difference was identified for rates of MRSA carriage ($P = .75$). A significantly different rate of MSSA carriage was identified among the wards ($P = .03$).

^a The number of HCWs screened does not represent the total, because 61 HCWs were screened twice.

^b The number of MSSA isolated does not represent the total, because 14 HCWs were positive for MSSA at both screenings. The percentage was calculated according to the 225 HCWs screened.

^c The percentage was calculated according to the 225 HCWs screened.

of adherence to the protocols in our hospital was only 17% (authors' unpublished data).

The high rates of carriage of methicillin-susceptible *S. aureus* observed among HCWs in the surgery ward and the ICU are possibly related to the fact that HCWs working in these wards have more-frequent and closer contacts with colonized patients and with patients' secretions than do HCWs working in other wards. Despite the occurrence of outbreaks due to MRSA-colonized HCWs, particularly when predisposing factors such as dermatitis are present, the identification of a colonized HCW generally does not indicate that the subject is the cause of the outbreak. Nasal screening of HCWs for MRSA could divert the attention of the HCWs themselves and of the infection control team from the real problems, such as adherence to hand hygiene protocols. MRSA carriers could be stigmatized, whereas MRSA-negative HCWs (ie, approximately everybody) could have a false sense of self-confidence. For this reason, the policy of our hospital is to perform nasal screening of HCWs only during outbreaks of MRSA infection.

Situations in which screening of HCWs for MRSA is indicated may include the following: (1) outbreaks of MRSA infection, when a significant proportion of HCWs may be colonized; (2) hospitals or areas where MRSA is rarely or never recovered, as is the case in The Netherlands, where an aggressive approach has been very effective in controlling MRSA diffusion;⁹ (3) in hyperendemic wards, when an HCW has to undergo major medical or surgical treatments, because, in such a case, the staff has to be considered at higher risk of MRSA infection; (4) when MRSA has been endemic in the ward for a short period; and (5) in cases in which gly-

copeptide-resistant or glycopeptide-intermediate *S. aureus* strains are recovered and the screening of every single contact, either patients or staff, is essential. In conclusion, we think that nasal screening of HCWs for MRSA in highly endemic areas may not be mandatory, should be tailored to the local situation, and should be based on rates of resistance to methicillin, the presence or absence of an outbreak, the presence of MRSA control programs, and the duration of endemicity of MRSA in the institution.

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