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LACK OF METHICILLIN-RESISTANT *Staphylococcus aureus* NASAL CARRIAGE AMONG PATIENTS AT A PRIMARY-HEALTHCARE UNIT IN PORTO ALEGRE, BRAZIL

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SUMMARY

Introduction: Community-associated methicillin-resistant *Staphylococcus aureus* (MRSA) has emerged as a pathogen in individuals without traditional risk factors. **Material and methods:** MRSA nasal carriage was assessed in individuals consulting at a Primary Health Unit in Brazil. **Results:** A total of 336 individuals were included: 136 were tested only for MRSA and 200 for any *S. aureus*. No MRSA was found among the 336 individuals and 23 (11.5%) of 200 were colonized by *S. aureus*. **Discussion:** Low prevalence rates have been found in non-hospitalized individuals, but MRSA surveillance should be encouraged to monitor clinical and molecular epidemiology of CA- MRSA.

KEYWORDS: Prevalence; Nasal carriage; Methicillin-resistant *Staphylococcus aureus.*

INTRODUCTION

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a major nosocomial pathogen. In recent years, however, community-associated (CA)-MRSA has emerged as a pathogen in adults and children without traditional risk factors for MRSA acquisition[3]. These isolates have their *mec*A gene carried in staphylococcal chromosomal cassettes (SCCmec), usually types IV or V, which are distinct from those classically associated with healthcare-associated MRSA[3]. CA-MRSA isolates are also more often susceptible to non-beta-lactams antibiotics and more frequently carry the Panton-Valentine Leukocidin genes[3].

The most common site for *S. aureus* carriage is the nose, and nasal carriage of CA-MRSA strains is associated with a higher incidence of clinical infection[9,10,12]. Prevention of staphylococcal infections and reduction of the spread of CA-MRSA are of great importance[12]. Thus, the objective of this report was to assess the prevalence of MRSA nasal carriage among individuals consulting at a primary-healthcare unit (PHU) in Porto Alegre, Brazil, where most cases of CA-MRSA from Brazil have been reported so far[11].

MATERIAL AND METHODS

Nares culture specimens were obtained from individuals attending Santa Cecília PHU, Porto Alegre, from March 2008 to December 2008. All consecutive individuals ≥ 18 years, enrolled in randomly selected days, were included in the study. Individuals who were not resident in the Porto Alegre city or who were unable to answer the questionnaire were excluded. The individuals were interviewed after their consultation and the variables collected were those presented in Table 1.

The individuals had the distal part of their anterior nares sampled for culture with five circular movements of each side with a swab. The swabs were immediately processed at the Microbiology Laboratory of Hospital de Clínicas de Porto Alegre. In the first period of study, the swabs were plated onto Mannitol agar supplemented with 6 µg/mL oxacillin. Since no MRSA had been found when around one third of the expected sample size had been completed, the swabs were plated onto Mannitol agar without oxacillin. Isolates were identified by Vitek system (bioMérieux, Marcy l'Etoile, France) and free-coagulase test. Oxacillin susceptibility was determined by disk diffusion test as recommended by the Clinical and Laboratory Standards Institute[2].

The study was approved by the local ethics committee. All patients signed information consent. Statistical analyses were carried out at the SPSS for Windows vs 13.0. All tests were two-tailed and a $p \leq 0.05$ was considered significant.

RESULTS

A total of 336 individuals were included in the study. The first 136 were assessed only for MRSA since the nasal swabs were plated onto selective media. The remaining 200 individuals had their swabs plated onto non-selective media. Among all 336 subjects, no MRSA was identified. Among the group of 200 subjects, 23 (11.5%) had *S. aureus* recovered from their nares. There was no significantly different

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Table 1
Characteristics of individuals assessed for *Staphylococcus aureus* nasal carriage

	S. aureus		
	Yes (n = 23)	No (n = 177)	*p*
Sex, female	18 (78.3)	129 (72.9)	0.80
Age, years	49.7 ± 17.5	52.8 ± 17.5	0.44
Antibiotic use within the last year	9 (39.1)	70 (39.5)	1.00
Presence of SSTI	4 (14.4)	24 (13.6)	0.54
Health professional	0 (0)	12 (6.8)	0.41
Health professional contact	7 (30.4)	48 (27.1)	0.93
Previous hospitalization (last year)	3 (13)	22 (12.4)	1.0
Medical consultation (last year)	15 (65.2)	129 (72.9)	0.60
Chronic disease			
Diabetes Mellitus	2 (8.7)	19 (10.7)	1.0
Chronic renal failure	0 (0)	1 (0.6)	1.0
Cardiac disease	7 (30.4)	73 (41.2)	0.44
Neoplasia	0	0	-
Other	10(43.5)	55(31.1)	0.24
Dialysis	0	0	-
Drug use	6 (26.1)	40 (22.6)	0.91
Cigarette	5 (83.3)	28 (70)	
Alcohol	0 (0)	4 (10)	
Cigarette + alcohol	1(16.7)	7 (17.5)	
Cigarette + marijuana	0 (0)	0 (0)	
Intravascular device	1 (4.3)	1 (0.6)	0.55
Surgery (last year)	2 (8.7)	17 (9.6)	1.0
Homosexual contact	0 (0)	1(0.6)	1.0
Contact with person with SSTI	0	4(2.3)	1.0

Values are number (%) or mean ± standard deviation. SSTI, skin and soft tissue infection.

characteristic between individuals who had their nasal swab plated on selective media and those where the swabs were plated on non-selective media, except for diabetes, which was more frequently among the former ones (21.3% versus 10.5%, respectively, $p = 0.01$). No variable was found to be significantly associated with *S. aureus* nasal carriage (Table 1).

DISCUSSION

Our study found no MRSA nasal carriage among patients attended to a PHU from Porto Alegre, a Brazilian city where the first CA-MRSA has been described in South America and where most cases of CA-MRSA have been described so far[11]. This result may be partially explained by the fact that we did not assess children, a population with higher rates of MRSA colonization[13]. Additionally, it should be acknowledged that nasal cultures may underestimate the real prevalence of *S. aureus* colonization, since it can also be found in other parts of the body as well, such as axilla and pharynx[7]. Our study had the capacity to detect a prevalence of 2 ± 2% with a 95% confidence interval. So, we were unable to detect a lower prevalence and it is possible that a prevalence lower than 2% could be undetected with our sample size.

MRSA have been considered a public health threat in Brazil[1], but, so far, no study has assessed the prevalence of CA-MRSA in the community in Brazil. Other community-based studies have also found low MRSA nasal carriage prevalence. HALABLAB *et al.*[5] have found eight (1.6%) MRSA nasal carries among 500 studied subjects. LAMARO-CARDOSO *et al.*[6] have assessed 1192 children and MRSA carriage was detected in 14 (1.2%) individuals. MONECKE *et al.*[8] have found 1.94% of MRSA among 155 *S. aureus* isolates recovered from asymptomatic carriers in Saxony, Germany. MUNCKHOF *et al*.[9] have found a prevalence of only 0.7% among 699 patients in Queensland, Australia.

GIULIANI *et al.* in a study conducted at Rome have also not found any MRSA in nasal swabs of HIV-1-infected men who have sex with men[4]. The authors have emphasized the importance of knowledge of local epidemiology concerning CA-MARSA prevalence, since their findings were, as was ours, very distinct from other regions, particularly from the United States, where higher rates have been found[4].

In summary, we presented a surveillance study showing the absence of MRSA nasal carriage among low-risk individuals. No risk factor was found to be significantly associated with *S. aureus* nasal carriage. We believe that MRSA surveillance studies in the community setting should be encouraged to gain a better understanding of clinical and molecular epidemiology of the emerging CA-MRSA isolates.

RESUMO

Ausência do carreamento nasal de *Staphylococcus aureus* resistentes à meticilina em pacientes em unidade básica de saúde de Porto Alegre, Brasil

Introdução: *Staphylococcus aureus* resistentes à meticilina associados à comunidade (CA-MRSA) têm emergido como patógeno em indivíduos sem os tradicionais fatores de risco. **Materiais e Métodos:** Carreamento nasal de MRSA foi avaliado em indivíduos atendidos em unidade básica de saúde. **Resultados:** 336 indivíduos foram incluídos: 136 foram testados somente para MRSA e 200 para qualquer *S. aureus*. Nenhum MRSA foi encontrado nos 336 indivíduos e 23 (11.5%) de 200 eram colonizados por *S. aureus.* **Discussão:** Baixas taxas de prevalência têm sido encontradas em indivíduos não-hospitalizados, entretanto a vigilância de MRSA é encorajada para o monitoramento da epidemiologia clínica e molecular do CA- MRSA.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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