DETECTION OF ANTIBIOTIC RESISTANCE GENES OF METHICILLIN-RESISTANT *Staphylococcus aureus* STRAINS FROM BRAZIL

Filipe Augusto Colombo\(^{a,b}\), Alexandre Conde\(^{b}\), Rogério Elsemann\(^{b}\), Estelamari Elsemann\(^{c}\), Paula Lucce Bohrer\(^{b}\), Alexandra Flávia Gazzoni\(^{a,b}\)

\(^{a}\) Oral Microbiology and Pathology Testing Service Laboratory. School of Dentistry. Faculdade da Serra Gaúcha, Brazil
\(^{b}\) School of Dentistry, Faculdade da Serra Gaúcha, Brazil

**INTRODUCTION:** Approximately 10% of *S. aureus* isolates in South America are susceptible to penicillin. However, many *S. aureus* strains, while resistant to penicillin, remain susceptible to penicillinase-stable penicillins, such as oxacillin and methicillin (2). Strains that are oxacillin and methicillin resistant, historically termed methicillin-resistant *S. aureus* (MRSA), are resistant to all β-lactam agents, including cephalosporins and carbapenems, although they may be susceptible to the newest class of MRSA-active cephalosporins (1). **SCIENTIFIC RESEARCH:** Strains of MRSA causing healthcare-associated infections often are multiply resistant to other commonly used antimicrobial agents, including erythromycin, clindamycin, fluoroquinolones and tetracycline, while strains causing community-associated infections are often resistant only to β-lactam agents and erythromycin, may be resistant to fluoroquinolones (2-3). In addition, staphylococcal resistance to oxacillin/methicillin occurs when an isolate produces an altered penicillin-binding protein, PBP2a, which is encoded by the *mecA* gene, as well as Protein A (*spa*) genes,
of the Staphylococcal Chromosome Cassette mec (SCCmec) and encoding Panton-Valentine leukocidin (PVL) (1,3). **OBJECTIVES:** Aim of this study was to assess the presence of the resistance to methicillin through of the detection of the Protein A (spa) genes, of the Staphylococcal Chromosome Cassette mec (SCCmec), as well as gene encoding Panton-Valentine leukocidin (PVL) in *Staphylococcus aureus* strains. **MATERIAL AND METHODS:** We conducted a study from the Culture Collection of Oral Microbiology and Pathology Testing Service Laboratory at the School of Dentistry of the Serra Gaúcha Faculty. The isolates was subcultured on Brain-Heart Infusion agar for 48 hours at 25°C in an aerobic atmosphere. All strains were submitted to catalase and coagulase tests. In order to confirm these characteristics, the isolates were also subcultured in mannitol salt agar. The resistance to methicillin was assessed using disk for cefoxitin. Minimum inhibitory concentration testing was done according to current Clinical and Laboratory Standards Institute Guidelines, criteria M100-S23 (2013) (1). Detection of the PVL encoding genes, SCCmec type and spa typing was done by Polymerase Chain Reaction (PCR). The PCR was performed by Microbiology Laboratory in the Medical School of the Rovira i Virgili University (CAT-Spain). We used a PCR previously described by European Union Reference Laboratory Antimicrobial Resistance. Collected data were analyzed using GraphPad 4.0 for Windows (GraphPad Software INC., La Jolla, CA). All data were initially submitted to bivariate analysis. This study was conducted according to the principles expressed in the Declaration of Helsinki. **RESULTS AND DISCUSSION:** To date 256 staphylococcal strains were screened in this microbiological study. Four (4.44 %) strains were identified as MRSA isolates. Genes coding for PVL were found in all MRSA isolates. Three MRSA isolates harbored SCC MEC type. Two strains carried MRSA presented spa types. **CONCLUSION:** We found that prevalence rates of *S. aureus* and MRSA colonization were slightly higher to those reported with CA-MRSA isolates in nationwide US surveys. Our results demonstrate the importance of including CA-MRSA among pathogens of interest for public health surveillance at the regional level. **FINANCIAL SUPPORT:** This study was supported by the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq, Brazil) (482052/2011-2) and Fundação de Amparo à Pesquisa do estado do Rio Grande do Sul (FAPERGS) (0690-2551/14-0). **REFERENCE**
