TITLE: SURVEY OF METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* NASAL COLONIZATION IN SWINES AND SWINE FARM WORKERS IN THE STATE OF RIO DE JANEIRO

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ABSTRACT:

Infections caused by multidrug-resistant bacteria have been a constant global concern. One of the most important multidrug-resistant bacteria is the methicillin-resistant *Staphylococcus aureus* (MRSA). The number of reports of MRSA isolation from different animal species suggests their potential participation as other sources of human infection. A strain of MRSA associated with livestock animals (LA-MRSA CC398) emerged and has been associated to swines and humans in contact with these animals. In Brazil, CC398 was reported in healthy children, patients with cystic fibrosis, bovine mastitis and one swine presenting epidermitis. This study investigates the occurrence of colonization and characterizes strains of MRSA isolated from swines and swine farm workers on properties located in the state of Rio de Janeiro. Nasal swab samples were collected from nostrils of 164 swines and 14 swine farm workers in 12 farms in the state of Rio de Janeiro, from 2014 to 2016. Samples were cultured onto Mannitol Salt Agar without and with 2 µg/mL oxacillin. Up to three suspected colonies of each plate were submitted to bacterial identification by conventional phenotypic tests and MALDI-TOF. Disk diffusion was used to determine the susceptibility to 11 antimicrobial agents. MRSA isolates were analyzed by PCR for detection of *mecA, pvl* and identification of *SCCmec* type. Theses isolates were also analyzed by multilocus sequence typing. Nine swines (5.5%) from six properties, and two humans (14.3%) from two of these properties were colonized with *S. aureus.* Swines colonized by *S. aureus* resistant to penicillin G (3.7%), ciprofloxacin (3.7%), clindamycin (4.3%), erythromycin (4.3%), norfloxacin (3.7%), tetracycline (3.7%), chloramphenicol (3.4%), gentamicin (1.8%), oxacillin (1.2%) and sulfamethoxazole-trimethoprim (1.2%) were found. Two animals (1.2%) were colonized by MRSA, but no worker was. They were resistant to six antimicrobials, in addition to beta-lactams, positive to *mec*A, negative to *pvl,* not typeable SCC*mec,* and identified as CC398. Methicillin-sensitive *S. aureus* with identical resistance profile, resistant to eight antimicrobials, were detected in swines and in one of the workers of the same farm. Low occurrence rate of MRSA was observed in swines analyzed in the state of Rio de Janeiro. For the first time, LA-MRSA CC398 was isolated from colonization of this host in our country.

Keywords: *Staphylococcus aureus*, LA-MRSA, antimicrobial resistance, swine

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