TITLE: BRAZILIAN MULTIDRUG-RESISTANT *STAPHYLOCOCCUS PSEUDINTERMEDIUS* FROM CANINE AND FELINE CLINICAL SPECIMENS: DETECTION AND TYPING

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ABSTRACT:

Staphylococcus pseudintermedius is an opportunistic and emerging zoonotic pathogen primarily associated with skin an ear infections in dogs. Antimicrobial resistance is a global threat and the emergence of methicillin-resistant *S. pseudintermedius* (MRSP) is of particular concern because many MRSP are also multidrug-resistant (MDR), leading to significant challenges to combat diseases. Despite its importance, little is known about MRSP circulating in Brazil. This study aimed to detect MDR in MRSP strains from canine and feline clinical samples and characterize these isolates by molecular analysis. Clinical samples submitted to two veterinary diagnostic laboratories in Rio de Janeiro between 2014 and 2017 were analyzed. Disease in the patients ranged from skin to urinary tract infections. Ninety-two *S. pseudintermedius* from 81 dogs and 11 cats were isolated and identified using traditional phenotypic tests, *nuc* PCR and matrix-assisted laser desorption ionization time-of-flight mass spectrometry (MALDI-TOF MS). All 92 isolates were investigated for methicillin susceptibility by disk diffusion and broth dilution, presence of *mec*A and SCC*mec* typing. Susceptibility analysis to additional antimicrobials was performed by broth microdilution using the NARM panel for Gram-positive isolates. Minimum inhibitory concentration (MIC) data was analyzed and isolates were considered MDR if they exhibited resistance at least one agent in three or more different classes. Multilocus Sequence Typing (MLST) and *spa* typing were carried out on 12 MRSP isolates. Regarding methicillin resistance, 22 (23.9%) were identified as MRSP by both phenotypic methods tested and *mec*A gene detection. The dominant SCC*mec* detected were type II-III (81.8%; 18/22). All MRSP isolates showed MDR profiles, being resistant to aminoglycosides, fluoroquinolones, lincosamides, macrolides, phenicols and tetracyclines. Two types of closely related *spa* were detected: t02 (75%; 9/12) and t06 (8.3%; 1/12). MLST typing revealed two STs/CCs: ST/CC71 (91.7%; 11/12) and ST265/CC258 (8.3%; 1/12) never reported in clinical MRSP strains from Brazil. The occurrence of the ST/CC71-*spa*t02-SCC*mec*II-III (75%; 9/12) worldwide strain among the strains evaluated was revealed and MDR was observed in all MRSP strains. This report highlights the need for further studies to determine the prevalence and characteristics of MRSP from Brazil, supporting preventive and control measures to overcome the antimicrobial resistance.

Keywords: MRSP, multidrug resistance, SCC*mec*, *spa* typing, MLST.