

TITLE: DETECTION OF MRSP (METHICILLIN-RESISTANT *STAPHYLOCOCCUS PSEUDINTERMEDIUS*) IN CATS AND DOGS FROM A VETERINARY TEACHING HOSPITAL IN RIO DE JANEIRO, BRAZIL

AUTHORS: MOTTA, C.C.; SOARES, B.S.; GOMEZ, M.A.; MELO, D.A.; SANTOS, T.H.; TAVARES, R.D.O.; LOGUE, C.M.; SOUZA, M.M.S.

INSTITUTION: UNIVERISDADE FEDERAL RURAL DO RIO DE JANEIRO, SEROPEDICA, RJ (BR-465, KM 7, CEP 23897-000, SEROPÉDICA – RJ, BRAZIL); IOWA STATE UNIVERSITY, AMES, IOWA (1907 ISU C-Drive, VMRI #5, 50011-1041 AMES – IA, USA)

ABSTRACT:

Staphylococcus pseudintermedius is commonly present in the skin and mucous membranes of dogs and is the most frequent bacterial pathogen isolated from clinical canine specimens. It is primarily associated with skin and ear infections, but can also be implicated in several infections which can be complicated if the strain involved is resistant to methicillin. The first report of methicillin-resistant *S. pseudintermedius* (MRSP) occurred in the United States in 1999 and since then an increasing number of studies have documented the rapid spread of MRSP in companion animals. Methicillin resistance is mediated by the *mecA* gene which, as in *S. aureus* (MRSA), encodes for the production of a modified penicillin-binding protein (PBP) that has low affinity for beta-lactam antibiotics. The aim of this study was to assess phenotypic methicillin resistance and the presence of the *mecA* gene in *S. pseudintermedius* (n=49) phenotypically identified by the Microbiological Diagnostic Laboratory at UFRRJ, from cats and dogs treated at the Veterinary Hospital of UFRRJ between 2014 and 2015. All isolates were tested for methicillin resistance by oxacillin disk diffusion and oxacillin broth dilution according to CLSI VET01S ED3 (2015) guidelines. DNA extraction was performed using the boil prep method and polymerase chain reaction (PCR) used to detect the *nuc* gene for species identification. The *mecA* gene was also detected by PCR. All isolates (100%, 49/49) tested positive for the presence of the *nuc* gene, confirming *S. pseudintermedius* species as the causative agent of infection in all cases examined. 83.7% (41/49) were from clinical specimens of dogs and 16.3% (8/49) were from cats. 18.4% (9/49) of the isolates examined were methicillin-resistant by both methods tested (disk diffusion and broth dilution) and they also carried the *mecA* gene, corroborating with studies that since 2006 report significant emergence of MRSP, despite the few data from Brazil. Additional work has examined these strains for their molecular profiles using PFGE and other subtyping tools including *mecA* subtyping and MLST analysis. Resistance to methicillin in *Staphylococcus* sp. is a serious problem worldwide and it's an increasing concern in *S. pseudintermedius* from companion animals. Bacteriological specimens are important for the correct identification of the agent and to select the best antimicrobial therapy. Therefore, veterinarians play an important role in preventing the spread of resistance.

Keywords: *Staphylococcus pseudintermedius*, methicillin-resistance, *mecA*, companion animals

Development Agency: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior and Conselho Nacional de Desenvolvimento Científico e Tecnológico