

TITLE: ANTIMICROBIAL RESISTANCE, BIOFILM PRODUCTION AND DIVERSITY AMONG *STAPHYLOCOCCUS* SPP. ISOLATED FROM HUMAN MILK AND COLONIZATION SITES OF LACTATING WOMEN

AUTHORS: NUNES, M.M.R.F.; RABELLO, R.F.; NOVAK, F.R.; ALBUQUERQUE, J.P.; PINHEIRO, M.S.

INSTITUTIONS: UNIVERSIDADE FEDERAL FLUMINENSE - INSTITUTO BIOMÉDICO, NITERÓI, RJ (RUA PROF. HERNANI MELO, 101, CEP 24210-130, NITERÓI – RJ, BRAZIL). INSTITUTO FERNANDES FIGUEIRA – IFF/FIOCRUZ, RIO DE JANEIRO, RJ (AVENIDA RUI BARBOSA, 716, CEP 20021-140, RIO DE JANEIRO – RJ, BRAZIL)

ABSTRACT: The ability of *Staphylococcus* spp. to cause infection in humans differs largely among various species of the genus. While *Staphylococcus aureus* stands out as the most important pathogenic species, coagulase negative staphylococci (CNSs), characterized as typical opportunists, stand out as important pathogens of infections related to health care. In addition to the pathogenicity potential, their ability to acquire antimicrobial resistance genes and biofilm formation capacity, attracts attention. The aim of this study was to detect the diversity between staphylococcal isolates from human breast milk (HBM) and four colonization sites of lactating women by conventional phenotype methods and by Matrix Assisted Laser Desorption Ionization Mass Spectrometry (MALDI-TOF MS). The antimicrobial susceptibility profile was evaluated by disk diffusion method and the capacity and intensity of biofilm formation by *S. aureus* were evaluated. Among the 79 samples analyzed, 14 (17.7%) were isolated from HBM; 21 (26.6%) from nares; 20 (25.3%) from oropharynx; 18 (22.8%) from hands and 6 (7.6%) from axilla. Seventy-five isolates were identified as staphylococci by MALDI-TOF MS technique and the following species diversity profile was detected: *S. aureus* (24%); *S. warneri* (44%); *S. epidermidis* (2.7%); *S. lugdunensis* (1.3%), *S. hominis* (1.3%) and *Staphylococcus* spp. (16%). Among 53 CNSs cultures, higher non-susceptibility profile was detected to: azithromycin (54.8%); erythromycin (52.9%) and penicillin (41.5%). Only one CNSs (1.9%) showed inducible clindamycin resistance. Antimicrobial susceptibility of 18 *S. aureus* cultures showed higher non-susceptibility profile to: penicillin (88%); gentamicin (5.6%); azithromycin (27.8%); ciprofloxacin (27.8%); erythromycin (27.8%) and ceftiofur (11.2%). Antimicrobial resistance to 3 or more classes was observed in 22 cultures (31%), indicating multidrug resistance. Two methicillin-resistant *S. aureus* (MRSA) were detected. The majority of *S. aureus* isolates were moderate to strong biofilm producers (16), one was weak and one did not produce biofilm. MALDI-TOF MS technique showed high sensitivity and specificity for the identification of staphylococcal species. The antimicrobial resistance of these species and the capacity of production biofilm gain a larger dimension due to the potential risk transmission of these microorganisms between mothers and their children.

Keywords: *Staphylococcus* spp, MALDI-TOF MS, Biofilm, Resistance.