

**TITLE:** RETROSPECTIVE ANALYSIS OF NASAL COLONIZATION BY METHICILLIN-RESISTANT *S. aureus* ISOLATES AMONG INDIVIDUALS ADMITTED AT A UNIVERSITY HOSPITAL (UH) IN RIO DE JANEIRO, DURING A FIVE-YEAR PERIOD

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Methicillin-resistant *Staphylococcus aureus* (MRSA) nasal colonization has been shown to increase the risk for Staphylococcal infections, frequently associated with high morbidity and mortality rates. The trimethoprim/sulfamethoxazole (TMP/STX) resistance can be used as a marker for hospital-acquired MRSA (HA-MRSA) isolates, while community-acquired MRSA (CA-MRSA) are usually susceptible to TMP/STX *in vitro*. The present study aimed to retrospectively analyze the nasal colonization by MRSA isolates among patients admitted at University Hospital (UH) in Rio de Janeiro, during a five-year period (2017 to 2021), and to differentiate them from HA to CA-MRSA, according to the TMP/STX resistance. Nasal swabs of individuals admitted in different wards were collected and inoculated in a MRSA Chrome Agar. After incubation, colonies characterized as MRSA were inoculated in mannitol salt agar for confirmation and submitted to the agar disk-diffusion method for detection of ceftioxin and TMP/STX resistance. Overall, 475 MRSA isolates from 449 individuals were identified, being considered one isolate per patient (N=449 MRSA isolates) in the present study. An average of 89.8 MRSA isolates per year was detected, most of them recovered during 2020 (113/449; 25.2%). Over the years, most isolates were recovered from patients admitted at the Intensive Care Unit (ICU) (89/449; 19.8%), followed by the Emergency Department (ED) (77/449; 17.4%), Pediatric Medicine (PM) (57/449; 12.5%), Coronary Unit (CU) (53/449; 11.8%), Neonatal ICU (NeoICU) (47/449; 10.5%), General Ward (GW) (42/449; 9.35%), General Surgery (GS) (39/449; 8.7%) and Hematology (H) (33/449; 7.3%). Among them, 167 (37.2%) MRSA isolates were also resistant to the TMP/STX disk, being characterized as HA-MRSA. We observed a decrease in the isolation of HA-MRSA isolates, from 50% in 2017 to 19.54% in 2021. When we analyze the proportion of HA-MRSA isolates for each ward, we observed that more than 40% of isolates recovered from individuals attended at the NeoICU (53.2%), H (51.5%), ICU (45%), GW (42.9%) and CU (41.5%), were characterized as HA-MRSA. In conclusion, we can suggest that around 80 patients admitted at the UH per year can be colonized by MRSA isolates, with a HA-MRSA proportion of 37%. For those admitted at NeoICU, Hematology, ICU, GW and CU, more than 40% were colonized by HA-MRSA isolates, suggesting a nosocomial acquisition of such isolates. However, we observed a decrease in the proportion of HA-MRSA in the UH analyzed, while the isolation of MRSA remains almost the same during, suggesting that CA-MRSA are increasing in our hospital as nasal colonizers.

**Keywords:** *Staphylococcus aureus*, nasal colonization; MRSA; HA-MRSA; CA-MRSA.

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