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Methicillin-resistant *Staphylococcus aureus* spreading through medical devices used in nursing care: what can we learn from Portugal?



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Background: Presently, Portugal faces the third highest level of *Staphylococcus aureus* in the European Union, leading to burdensome outcomes for health systems, public institutions, patients and their respective families. A significant contamination rate of portable medical devices used by nurses in direct patient care was identified in four medical wards in a large public tertiary hospital. We described the degree of contamination and investigate associated risk factors.

Methods & Materials: Descriptive-correlational and cross-sectional study. The target population corresponds to all nurses who provide direct patient care in the referred settings. Medical devices were swabbed and cultured in Mannitol salt agar (MSA). The obtained isolates were subjected to the latex agglutination test in order to investigate the presence of *Staph. aureus*. Additional information regarding medical devices management by nurses was collected by individual questionnaire. Data were analyzed with IBM SPSS 20.

Results: Between April and June 2017, 383 medical devices carried by 50 nurses in their uniform pockets were tested. The most representative devices were tourniquets (68%), adhesive rolls (56%), scissors (26%) and thermometers (20%). Colonies of *Staphylococcus coagulase positive* (32%) and negative (27%) were identified, ranging from 1.0×10^1 to $> 1.5 \times 10^3$ CFU/mL. The highest CFU/mL values were observed in reusable tourniquets and axillary thermometers. Overall, and regarding *Staphylococcus* isolates, 66.6% were positively identified as Methicillin-resistant *Staphylococcus aureus* (MRSA). Data retrieved from questionnaires evidences that nurses reuse these devices between patients (100%); commonly share these devices with other healthcare professionals such as other nurses, physicians and assistants (92%), are unaware of clin-

ical guidelines regarding medical devices management (82%); lack infection prevention and control training (42%); and don't properly clean these devices during patient care (32.7%).

Conclusion: Fundamental lack of recurrent training, access to specific institutional guidelines and ineffective management of these devices, including lack of cleaning/disinfection, reuse between procedures/patients and sharing them with other professionals were associated with MRSA. The implementation of pathways for medical device management, mandatory staff training and introduction of single-use medical devices in medical wards are recommended to prevent/control future MRSA outbreaks.

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