Clustering and risk factors of methicillin-resistant Staphylococcus aureus carriage in two Italian long-term care facilities.

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BACKGROUND: Methicillin-resistant Staphylococcus aureus (MRSA) is a well-recognized agent of health care-associated infections in long-term care facilities, but few data about the circulation of MRSA in this setting in Italy are available. The aim of the study is to determine the prevalence and risk factors for MRSA carriage in nursing home residents in Vicenza (northeastern Italy). PATIENTS AND METHODS: A point prevalence survey was conducted in two long-term care facilities (subdivided into 15 wards) from 12 June 2006 to 6 July 2006. Anterior nasal swabs were obtained from residents and laboratory screening for MRSA was performed; full antibiotic susceptibility was assessed in MRSA isolates. Macrorestriction analysis of chromosomal DNA was carried out by pulsed field gel electrophoresis (PFGE). For each subject, demographic data, length of stay, dependency, cognitive function, presence of medical devices, comorbidities, current and previous antibiotic treatment, previous hospital admission and presence of infection were assessed on the day of sample collection. Factors that were found to be significantly associated with MRSA carriage at univariate analysis were introduced into multilevel logistic regression models in order to estimate the odds ratios (OR) with 95% confidence intervals (CI) for the risk of MRSA colonization, taking into account the clustering of patients within wards. RESULTS: Nasal swabs were obtained in 551 subjects; overall 43 MRSA carriers were detected (7.8%; CI = 5.7-10.4%). The rate of nasal carriers was very similar in the two institutions, and varied from 0% (0/36) to 18% (7/39) between wards. Only two out of 15 wards were found to have no MRSA carriers; overall, three pairs of colonized roommates were detected. Upon multilevel logistic regression, the risk of MRSA carriage was increased in patients with cancer (OR = 6.4; CI = 2.5-16.4), in those that had undergone recent hospitalization (OR = 2.2; CI = 1.0-4.4), and it reached OR = 4.0 (CI = 1.7-9.9) in those with three or more antibiotic treatments in the previous year; about 10% of the variability in MRSA carriage could be attributed to differences between wards. Pulsed field gel electrophoresis analysis permitted the definition of six clusters; two of these comprised 78.6% of the studied isolates and were quite similar, with one being more strongly represented among subjects hospitalized in the previous 12 months. All of the MRSA strains were resistant to ciprofloxacine; nevertheless, the majority were susceptible to most other non-betalactam antibiotics. CONCLUSION: The study suggests that nursing homes are a significant reservoir for MRSA. Statistical and PFGE analyses indicate a scenario where MRSA seems to be endemic and individual risk factors, namely recent hospitalizations and repeated antibiotic treatments, play a major role in the selection of drug-resistant organisms. Infection control measures should be coordinated among different health care settings, and the appropriate use of antibiotics has emerged as an important issue for improving the quality of care.

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