

Preemptive Isolation to Prevent Methicillin-Resistant *Staphylococcus aureus* Cross-Transmission in Diabetic Foot

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Dedicated foot units have been developed to improve diabetic foot ulcers management. However, methicillin-resistant *Staphylococcus aureus* (MRSA) is isolated from 20 to 30% of infected diabetic foot ulcers (1–3). Consequently, placing colonized patients and at-risk patients with open wounds in the same unit may speed up MRSA cross-transmission (4). Therefore, although the impact of MRSA on the outcome of the ulcer remains debatable (5,6), the prevention of MRSA cross-transmission should be a priority in such units (6–8). The implementation of strict isolation precautions is highly recommended (9–12) because MRSA is mainly transmitted through the hands of transiently colonized health care personnel (9,13,14). Our objective was to assess the efficiency of preemptive isolation procedures implemented in a diabetic foot unit to prevent MRSA cross-transmission.

RESEARCH DESIGN AND METHODS

All patients consecutively admitted to a nine-inpatient specialized diabetic foot unit were included during a 66-month period. Contact isolation measures implemented during the entire study period for MRSA carriers were as follows: placing MRSA patients in a single room, systematic use of disposable gowns and gloves before entering pa-

tients' rooms, hand washing with antiseptic soap or hydro-alcoholic hand rubbing at room exit, education for all the staff, and prospective surveillance of MRSA carriers. MRSA screening was systematically performed for each foot wound at admission and once a week until patient discharge. MRSA acquisition in the unit was deemed to be likely when all the following conditions were fulfilled: no MRSA isolation at admission, MRSA isolation from one of the wound samples, and MRSA susceptibility profile (antibiogram) identical to one MRSA isolated from another patient hospitalized in the diabetic foot unit during the same period of time. From October 1997 to December 1998, previously described contact isolation precautions were applied after MRSA isolation, i.e., mainly 72 h after admission. From January 1999 to June 2003, preemptive contact isolation was implemented on admission for all patients, until the results of the MRSA screening wound samples were found to be negative. To answer the question about efficiency of these preemptive isolation procedures, we used a before-after design, considering the first period as a control period and the second as a test period.

As the risk of cross-transmission raises with the number of hospitalized MRSA carriers and their hospital-stay duration, the risk of transmission or coloni-

zation pressure was expressed as a number of MRSA-positive patient-days. The acquisition rate was expressed as the number of MRSA acquisition per MRSA-free patient-days.

RESULTS — There were 581 consecutive admissions for 527 patients, accounting for a total of 18,232 patient-days (mean duration of stay 31.4 days). The main patient characteristics are given in Table 1. As expected, most patients had complicated diabetes with at least two complications, and one-half of them had chronic foot ulcers for long-term duration (mean 265 days). A total of 179 (31%) patients were MRSA carriers in foot wounds on admission, resulting in 5,224 MRSA-positive patient-days or 29% of the total patient-days. The colonization pressure was higher during the intervention period (29.8% of the total patient-days) than during the control period (24.2%; $P < 0.01$). In contrast, the rate of acquisition was significantly lower in the intervention than in the control period: seven acquisitions per 10,154 MRSA-free patient-days (0.07%) compared with six acquisitions per 2,854 MRSA-free patient-days (0.21%; $P = 0.04$), respectively. The relative risk of acquiring MRSA during the second period relative to the first period was 0.33 (95% CI 0.11–0.98).

Table 1—Demographic and clinical data (n = 527)

Male sex (%)	413 (78)
Age (years)	65 ± 12
Type 2 diabetes (%)	432 (82)
Diabetes duration (years)	21 ± 13
A1C (%)	8.1 ± 1.9
Retinopathy (%)	402 (76)
Nephropathy (%)	329 (64)
Renal replacement therapy	59 (11)
Neuropathy (%)	492 (93)
Arteriopathy (%)	331 (63)
Osteomyelitis (%)	304 (58)
Gangrene (%)	195 (37)
Previous wound (%)	266 (50)
Duration of ulcers (days)	265 ± 395

Data are n (%) or mean ± SD.

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Abbreviations: MRSA, methicillin-resistant *Staphylococcus aureus*.

A table elsewhere in this issue shows conventional and Système International (SI) units and conversion factors for many substances.

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CONCLUSIONS — Although the total MRSA acquisition rate is rather low in our unit, it was further decreased during a period where preemptive contact isolation was implemented for all patients, as observed in other settings (15). Although uncontrolled confounding factors may not be excluded, preemptive isolation warrants further study, especially cost-effectiveness studies, in diabetic foot units.

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