Journal of Hospital Infection 88 (2014) 179–180

Available online at www.sciencedirect.com

Journal of Hospital Infection

journal homepage: www.elsevierhealth.com/journals/jhin

Letters to the Editor

Universal decolonization to prevent intensive care unit meticillin-resistant *Staphylococcus aureus* infection

Madam,

In 2013, Huang *et al.* reported a comparison of three strategies for reducing meticillin-resistant *Staphylococcus aureus* (MRSA) infections in intensive care unit (ICU) patients which were: (1) admission MRSA screening, with isolation of detected/known MRSA patients; (2) as per strategy 1, with MRSA decolonization of MRSA-colonized patients; (3) universal MRSA decolonization (mupirocin/chlorhexidine) for five days without MRSA screening.[1] Outcomes were detection of MRSA from clinical isolates and bloodstream infection. Huang *et al.* concluded that universal MRSA decolonization in ICUs was more effective than the other strategies in reducing rates of MRSA clinical isolates and bloodstream infection from any pathogen. On this background, we assessed Huang's publication with consideration to implementing a universal MRSA decolonization strategy. After assessing Huang *et al.*'s methods and results, it was not felt that the evidence presented supported universal MRSA decolonization due to a number of limitations within the data presented.

Limitations included three testing biases. First, there was no standard process for the collection of clinical samples or blood cultures in the different study arms. This bias may not have been avoidable, but different numbers of MRSA in the different study arms may simply reflect different rates of sampling. The total number of samples collected and infections diagnosed per study arm requires reporting to assess this potential bias. Second, microbiological testing of clinical samples was at risk of false-negative results. Topical antimicrobial agents may have contaminated clinical samples, reducing the detection of MRSA. Third, the testing period of the study was biased to interventions acting within the study period. The study period included only the ICU stay and the next 48 hours; and the median ICU stay was only three days. Since single courses of decolonization are not universally effective, with estimates of 63% efficacy in one study, unsuccessfully decolonized and unidentified MRSA colonized patients will remain at increased risk of MRSA infection.[2]

Further, the results of the study were not placed in context of the current literature. For example, the reduction in any pathogen bacteraemias in the universal decolonization group was mostly accounted for by reductions in skin commensal organisms, e.g. coagulase-negative staphylococci, a widespread cause of catheter-related bloodstream infection (CRBSI). Studies have shown that CRBSI rates are modifiable. Pronovost *et al.* demonstrated CRBSI reductions through a number of interventions, e.g. full-barrier precautions during the insertion of central venous catheters.[3] Rates of bacteraemia were reduced from a mean rate per 1000 catheter-days of 7.7 at baseline to 1.4. Bacteraemia rates by catheter-days were not reported in Huang *et al.*'s study. It is therefore difficult to compare the results by Provonost *et al.* to the rates achieved of 3.6–3.7 per 1000 bed-days with screening and decolonization and with universal decolonization. CRBSI rates should have been reported in Huang *et al.*'s study to allow comparisons to data by Pronovost *et al.* In addition, the compliance with interventions to reduce CRBSI is not reported in any of the study arms. Due to the efficacy of interventions to prevent CRBSI, it seems possible that institutions with low CRBSI rates due to robust central venous catheter care might not show any benefit from universal decolonization.

The study concludes that 'universal decolonization was more effective than targeted decolonization … in reducing rates of MRSA clinical isolates'. This conclusion of the study is presented without respect to accepted ranges for statistical significance. The reduction in MRSA in clinical isolates in the targeted decolonization group was not significantly lower than in the universal decolonization group ($P = 0.16$). Nor was significant reduction found in MRSA bacteraemia rates in the universal decolonization group, compared either to pre-intervention rates or to MRSA bacteraemia rates in the other study groups (1 and 2).

Finally, the cost-effectiveness of the strategy is not well reported. Reductions in MRSA bacteraemia by universal decolonization are reported at one per 10,000 bed-days. Since the median duration of participation in the study was five days, ~2000 ICU patients would need to be treated to prevent one MRSA bacteraemia. Using the article's cost of US$40 per patient for the decolonizing product and personnel effort, a crude estimate would be a cost of US$80,000 per MRSA bacteraemia prevented, ignoring the non-significance of this reduction in MRSA bacteraemia. This estimate is crude, and we invite the authors to perform a cost-effectiveness analysis to allow clinicians to assess the relative merits of this intervention strategy.

Conflict of interest statement
None declared.

Funding sources
None.

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Available online 28 August 2014

http://dx.doi.org/10.1016/j.jhin.2014.08.003

Preventing group A streptococcus cross-infection on ear, nose and throat wards

Madam,

We read with interest the paper by Mahida *et al*. regarding contaminated curtains as a vector for cross-infection with group A streptococcus on an ear, nose and throat (ENT) ward.[1] Over a six-week period last year, we identified group A streptococcus from a stoma site, blood culture, neck wound, and sputum sample from four different patients on our regional ENT ward. These patients had all had complex surgery to treat malignancies in the preceding month. The isolates were all resistant to erythromycin, clindamycin, and doxycycline, alerting us to the potential link, and all were typed as emm st11.0.

Like Mahida *et al*., we formed an outbreak team and conducted a review of events, existing practice and enhanced surveillance. Extensive staff and environmental screening failed to identify a point source. The environment was thoroughly cleaned, curtains replaced and best practice reinforced. Access for patients belonging to other specialties to the ENT ward was restricted, recognizing the risk posed to surgical patients with open wounds and the risk of wandering medical patients acting as a vector for spread. No further cases with this strain have been seen on this ward since.

Interestingly, a 44-year-old patient admitted with pneumonia three months later had a group A streptococcus bacteraemia diagnosed on admission with the aforementioned susceptibility pattern. It transpired that this patient was a member of a community care team who had had repeated prolonged contact with one of the original patients from the initial outbreak in the community. This isolate was also emm st11.0.

Our experience is a reminder that, whereas patients are frequently admitted to ENT wards with infections caused by group A streptococcus, one must be alert to the fact that cases may be linked. A point source for the outbreak was not identified. The ward in question has a good track record in passing regular environmental and hand hygiene audits. In spite of repeated efforts, the personality of the individuals involved and their social behaviours posed particular challenges as patients struggled to understand the consequences of breeching infection control precautions when managing tracheostomy tubes. We feel that this may have exacerbated the outbreak. Intensive patient education and high-level vigilance to ensure compliance with optimal techniques are essential.

Moving forward, it is critically important that ENT wards are designed in such a way that the specific needs of this complex patient population are met and that the risk of cross-infection is minimized. This has been reflected in the design of our new ENT ward. Meticulous environmental screening and cleaning, including curtains, is essential in outbreak control. Community vectors may be considered. Ultimately, educating patients, relatives, hospital staff, and community staff of the importance of infection control precautions when managing tracheostomy tubes should help to prevent cross-infection.

Conflict of interest statement
None declared.

Funding sources
None.

Reference

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Available online 28 August 2014

http://dx.doi.org/10.1016/j.jhin.2014.08.004