**Universal decolonisation to prevent ICU MRSA infection**

Madam,

In 2013, Huang *et al* reported a comparison of three strategies for reducing MRSA infections in ICU patients which were: 1-Admission MRSA Screening, with isolation of detected/known MRSA patients; 2- As per strategy 1, with MRSA decolonisation of MRSA colonised patients; 3- Universal MRSA decolonisation (mupirocin/chlorhexidine) for five days without MRSA screening.1 Outcomes were detection of MRSA from clinical isolates and bloodstream infection. Huang concluded universal MRSA decolonisation 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 decolonisation strategy. After assessing Huang’s methods and results it was not felt the evidence presented supported Universal MRSA decolonisation due to a number of limitations within the data presented.

Limitations included three testing biases; firstly, 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. Secondly, 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. Thirdly, 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. Given single courses of decolonisation are not universally effective, with estimates of 63% efficacy in one study, unsuccessfully decolonised patients will remain at increased risk of MRSA infection.2

The results of the study were also not placed in context of the current literature. For example, the reduction in any pathogen bacteraemias in the universal decolonisation group was mostly accounted for by reductions in skin commensal organisms e.g. coagulase negative staphylococci, a common cause of catheter-related blood stream infection (CRBSI). Studies have shown 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’s study. It is therefore difficult to compare the results by Provonost et al to the rates achieved of 3.6-3.7/1000 bed days with screening and decolonisation and universal decolonisation. CRBSI rates should have been reported in Huang’s study to allow comparisons to data by Pronovost. In addition, it is not reported what the compliance with interventions to reduce CRBSI are in any of the study arms. Given the efficacy of interventions to prevent CRBSI it seems possible institutions with low CRBSI rates due to robust CVC care would not show a benefit with universal decolonisation.

The study concludes “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 decolonisation group was not significantly lower than in the universal decolonisation group (p=0.16). Also, no significant reduction was found in MRSA bacteraemia rates in the universal decolonisation group, either compared 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 bacteraemias by universal decolonisation are reported at 1 per 10,000 bed days. Given the median duration of participation in the study was 5 days, approximately 2000 ICU patients would need to be treated to prevent 1 MRSA bacteraemia. Using the papers cost of $40 per patient for the decolonising product and personnel effort a crude estimate would be a cost of $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.

**References**:

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3. Pronovost P, Needham D, Berenholtz S, et al. An intervention to decrease catheter-related bloodstream infections in the ICU. *N Eng J med*. 2006;355:2725-32.