Key points

- Nasal carriers of *Staphylococcus aureus* are at increased risk of healthcare associated infections with this organism.¹⁻³
- This study demonstrated that rapid decolonisation of the nostrils with mupirocin and of the skin with chlorhexidine gluconate (HiBiScrub®) reduced hospital acquired *S. aureus* infections in nasal carriers by nearly 60%.

Introduction

Nasal carriers of *Staphylococcus aureus* bacteria have a three to six times higher risk of healthcare associated infections than non and low-level carriers.¹⁻³ More than 80% of these infections are endogenous, i.e. from within the body.⁴⁻⁶

The role of intranasal application of the antibiotic mupirocin in decolonisation and infection-prevention has been studied in both the surgical and non-surgical setting. Results are conflicting, with timing of application and/or presence of bacteria on the skin, potentially contributing towards the variance.⁷⁻¹⁴

This randomised, double-blind, placebo-controlled study examined the impact of decolonisation of the nostrils with mupirocin and of the skin with chlorhexidine gluconate (HiBiScrub®) on the prevention of hospital acquired infections with *S. aureus* among nasal carriers of the bacteria.

Methods

- Adult patients newly admitted to the departments of surgery and internal medicine were screened for *S. aureus* using real-time polymerase-chain-reaction (PCR) assays.
- *S. aureus* carriers expected to be hospitalised for a minimum of 4 days were randomised 1:1 to receive either active treatment of nasal mupirocin 2% ointment and chlorhexidine gluconate soap 40mg/ml (HiBiScrub®), or placebo ointment and soap.
- 505 patients received active treatment (504 were included in the statistical analysis as one withdrew consent), 413 received placebo.
- Nasal ointment was applied twice daily and the soap was used daily for a whole body wash for a duration of 5 days.
- Patients were then monitored for hospital acquired *S. aureus* infection for 6 weeks after discharge – culture samples were collected if infection was suspected.
Results
The cumulative incidence of healthcare associated S. aureus infection was significantly lower in the mupirocin-chlorhexidine group at 3.4% (17/504) than in the placebo group at 7.7% (32/413). The time to infection with S. aureus was also significantly shorter in the placebo group (p=0.005).

The length of hospitalisation was shorter in the active treatment group than in the placebo group (crude estimate, 12.2 vs. 14.0 days).

There were no differences between surgical and non-surgical patients in terms of S. aureus infection incidence.

Among surgical patients, deep surgical site infections were the most common hospital acquired infection, and these occurred significantly less frequently in the mupirocin-chlorhexidine group than in the placebo group at 0.9% (4/441) and 4.4% (16/367), respectively.

Conclusion
Hospital acquired S. aureus infections in nasal carriers are reduced by nearly 60% if rapid decolonization is done for both nasal and extra-nasal sites with a combination of mupirocin nasal ointment and chlorhexidine gluconate whole body washing. It also significantly reduced the mean hospital stay by almost 2 days.

Rapid detection of S. aureus nasal carriage, and decontamination of the skin as well as the nasal passages, is needed to achieve the level of prophylaxis observed in this trial.

References