Clinical Summary:

A preoperative decolonization protocol for *Staphylococcus aureus* prevents orthopaedic infections

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Key Points

- Preoperative decolonization with mupirocin and chlorhexidine solution reduced overall infection by 42%.
- Preoperative decolonization was associated with reduced *Staphylococcus aureus* Surgical Site Infections (SSIs).
- Implementing the preoperative decolonization protocol translated to an adjusted economic gain of $231,741 for the hospital during the intervention period.
- Preoperative decolonization with mupirocin and chlorhexidine solution was not associated with any adverse events.

Background

Orthopedic surgical site infections (SSIs) can cause significant morbidity, prolong hospital stays by a median of two weeks, double rehospitalization rates, and more than triple overall healthcare costs.[1]

Prevention of SSIs requires identification of risk factors and appropriate intervention.[2] For example, there is a strong association between nasal carriage of *Staphylococcus aureus* and development of *S. aureus* SSI: carriers are two to nine times more likely to have *S. aureus* SSIs than non-carriers.[3-5]

Intranasal mupirocin eradicates nasal colonization in a wide variety of patients.[4,5] Recently, chlorhexidine bathing has been combined with intranasal mupirocin with an aim to eradicate carriage of methicillin-resistant *S. aureus* (MRSA) [6,7] and to reduce nosocomial MRSA infections in intensive care units (ICUs).[8] The combination is simple and has no major side effects.[6,7,9]

Objectives

This study was performed to determine whether preoperative decolonization using mupirocin ointment and clorhexidine solution reduces *S. aureus* SSIs in patients undergoing total joint arthroplasty (TJA).

Design

This was a prospective, observational study involving patients scheduled for TJA. The study was designed to estimate potential cost savings based on a previous report of SSI costs.

The concurrent control group comprised patients of surgeons who did not participate in the intervention study. The pre-intervention control group comprised patients of participating surgeons who had undergone elective TJA during the previous year.

Patients in the intervention group were screened for *S. aureus* prior to surgery. Carriers of *S. aureus* were decolonized using mupirocin ointment to the nares twice daily and bathed once daily with chlorhexidine solution for the five days before surgery.

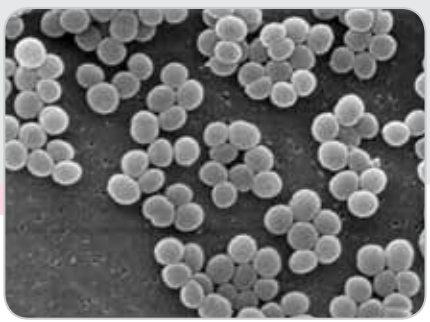
Results

Screening yielded positive nasal cultures in 164 of 636 participants (26%), including 147 with MSSA (23%) and 17 with MRSA (3%). Patients with positive cultures applied mupirocin to the nares twice daily and chlorhexidine solution once daily for five days prior to surgery.

Over one year of follow-up, no *S. aureus* SSIs were reported in the intervention group, compared with 12 patients in the concurrent control group. The overall infection rate, including nonstaphylococcal infections, decreased from 2.6% during the pre-intervention period to 1.5% during the intervention period – a reduction of 42%. The reduced incidence of infection during the intervention period translated to an adjusted economic gain of $231,741 compared with the preintervention period.

Conclusion

The data from our prospective observational study suggest a preoperative decolonization that includes mupirocin and chlorhexidine bathing is a safe way to significantly reduce *S. aureus* SSIs in patients undergoing TJA and may translate to economic savings for the hospital or healthcare institution.



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