

Routine Screening for MRSA and Decolonization of Hip Fracture Patients Significantly Reduces MRSA and Superficial Wound Infection, But Not Deep Infection

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Purpose: Surgical site infection (SSI) remains a serious complication after hip fracture surgery with a negative effect on mortality, morbidity, and health-care costs. Methicillin-resistant *Staphylococcus aureus* (MRSA) SSI increases both health-care costs and 1-year mortality compared to non-MRSA SSI. During 2008 our hospital implemented routine MRSA screening and decolonization of trauma patients. We sought to establish the effect of this screening program in our local hip fracture population.

Methods: Using prospectively collected data for all hip fracture admissions to our hospital, we compared a cohort of consecutive patients admitted before the implementation of screening (from 1999 to 2004, n = 3563) to another post-screening cohort (consecutive patients from 2009 to 2016, n = 6581). Rates of MRSA SSI and overall deep and superficial SSI (from all organisms) were compared pre- and post-change. The diagnosis of SSI was verified from hospital notes and microbiology records and grouped into superficial or deep infection using the Centers for Disease Control and Prevention (CDC) criteria. Demographics of the cohorts were compared and multiple logistic regression analysis was used to investigate potential risk factors of infection. One-year mortality with and without infection was compared between the 2 groups.

Results: Overall 39 cases of MRSA SSI were detected in the pre-screening group, compared to 10 in the post-screening group ($P < 0.0001$). Overall superficial SSI decreased (1.4% vs 0.4%, $P < 0.001$); however, deep SSI did not (1.15% vs 1.11%, $P = 0.6$). We observed a significant increase in coagulase-negative staphylococcus SSI in the post-screening group (0.36% vs 0.08%, $P = 0.016$). It is possible that the targeted elimination of 1 organism may allow other organisms an opportunity to cause SSI. Multivariate logistic regression analysis demonstrated several significant risk factors for developing SSI: surgery with an Austin Moore (odds ratio [OR] 3.175, $P = 0.005$) or Dynamic Condylar Screw (OR 5.888, $P = 0.036$), anticoagulation with warfarin (OR 2.117, $P = 0.004$), or the presence of sacral pressure sores (OR 3.058, $P = 0.02$). One-year mortality without SSI was lower post-screening (33% vs 25%, $P < 0.001$) showing a continuous improvement in neck of femur care. However, despite the reduction in MRSA SSI, mortality at 1 year after deep SSI remains high (50% pre-screening vs 46% post screening, $P = 0.56$).

Conclusion: The routine screening for MRSA and decolonization of hip fracture patients significantly reduces MRSA and superficial SSI, supporting the implementation of screening programs. However, rates of, and survival after, deep SSI have not improved over a 17-year period, demonstrating that deep SSI remains a serious and unsolved problem.