Universal Nasal Povidone-Iodine Staphylococcal Decolonization for Total Joint Arthroplasty of the Hip and Knee in a Health Safety-Net Hospital

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INTRODUCTION:

Total joint arthroplasty of the hip and knee (TJA) are among the most common surgical procedures performed in the US. The most common complication of TJA - prosthetic joint infection (PJI) - is associated with significant morbidity and mortality. Pre-operative decolonization of staphylococcal aureus carriers reduces the risk of PJI.

Standard of care for staphylococcal decolonization includes nasal swab screening to identify and treat carriers with twice daily nasal mupirocin for 5 days; all patients receive chlorhexidine-gluconate soap (CHG). This protocol relies on patient compliance and personnel to contact carriers, both potential barriers in a safety-net hospital due to lower health literacy and resource limitations. We propose a universal decolonization protocol with nasal povidone-iodine (PVP-I) administered pre-operatively on day of surgery.

METHODS:

A prospective case-control study was performed to evaluate the effect of a universal nasal PVP-I protocol implemented May 2022 in all TJA patients at a single, health safety-net hospital in comparison to controls who received standard of care (Mupirocin) protocol prior to this date. Patients in both groups were given CHG wash and nasal screens to rule out Methicillin-Resistant Staphylococcus Aureus (MRSA). MRSA-positive patients received prophylactic vancomycin in addition to cefazolin. Primary outcome measures: surgical site infection (SSI) and deep prosthetic joint infection; secondary outcomes: adverse events. Chi Square test and Fisher's exact test were used to compare outcomes.

RESULTS:

4286 patients were analyzed: 994 PVP-I patients and 3292 controls. Incidence of PJI was lower in PVP-I group versus controls at 30 days (0.2 vs 0.7, p=0.073) and 1 year (0.3 vs 1.2, p=0.009). No significant difference was noted for surgical site infections between those receiving PVP-I versus mupirocin. No adverse events were reported for either group.

DISCUSSION AND CONCLUSION:

Universal staphylococcal decolonization with PVP-I was associated with reduced PJI compared to current standard of care decolonization with mupirocin of carriers only. This protocol has benefits in a health safety-net setting as it preludes the need for resources for screening follow-up, eliminates reliance on patient compliance.

Table 1: PVP-I arm vs Mupirocin

	PVP-I n=994 (%)	Mupirocin n= 3292 (%)	p-value
Infection rate (30 days post-op) [b]	4 (0.4)	33 (1.0)	0.073
SSI	2 (0.2)	10 (0.3)	
PJI	2 (0.2)	23 (0.7)	
Infection rate (1-year post-op) [b]	5 (0.5)	52 (1.6)	**0.009**
SSI	2 (0.2)	14 (0.4)	
PJI	3 (0.3)	38 (1.2)	
Adverse events	0	0	

Table 1. Comparison of surgical site and deep prosthetic joint infection outcomes between patients receiving universal nasal povidone-iodine (PVP-I) decolonization and those receiving standard mupirocin-based decolonization prior to total joint arthroplasty.