Prospective, Randomized, Blinded Study to Evaluate the Efficacy of Two Surgical Skin Preparations in Reducing SSI after TJA

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Background: Surgical site infection (SSI) following total joint arthroplasty (TJA) is a devastating complication with on patients and healthcare. Due to the presence of foreign material, prevention of SSI in this patient population is challenging. We hypothesized that a majority of contaminants of the surgical site are introduced during surgical draping and that repeat skin antisepsis prior to application of the incise drape is likely to reduce the incidence of SSI.

Methods: This randomized, single-blind, prospective study recruited 600 patients undergoing TJA between March 2010 and Nov 2011 at a single center. In the control group standard skin preparation with chlorhexidine (pre-op shower), alcohol and betadine (intra-op skin preparation) was performed, followed by surgical draping. The incise drape was applied once the skin was dry. In the experimental group identical prep of the skin was performed, but prior to application of the incise drape, additional skin preparation with iodine povacrylex (iodophor)/alcohol combination (DuraprepTM) was applied. There were no differences shown in any confounding variables.

Results: 581 patients were eligible for randomization. The repeat antisepsis prior to incise draping significantly reduced the incidence of SSI in patients undergoing TJA; there were no patients diagnosed with SSI in the experimental group (0/284) compared to a 2.06% incidence of SSI in the control group (6/297) ($p<0.0307$). Skin blistering within 6 weeks after surgery was also lower in the experimental group at 3.52% (10/284) versus 6.23% (18/289) in the control group ($p=0.1745$).

Conclusion: Repeat skin antisepsis after surgical draping and prior to incise draping does lead to a significant reduction in SSI; we believe this benefit is a result of removing contaminating organisms that gain access to the surgical site during surgical draping. Reduction in skin blistering may also be attributed to this effect. While the use of any skin prep which contains alcohol requires caution due to its flammable nature, we believe that with proper precautions; repeat skin antisepsis is a valuable addition to surgical preparation.