Efficacy of Surgical Preparation Solutions in Lumbar Spine Surgery

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**Introduction:** Postoperative spinal wound infections are relatively common, and they are associated with significant morbidity, increased costs, and poor long-term outcomes. The purposes of this study were to identify the common bacterial flora found on the skin overlying the lumbar spine, and evaluate the efficacy of readily available skin-preparation solutions in the elimination of bacterial pathogens from the surgical site following skin preparation.

**Methods:** A prospective, randomized study was undertaken to evaluate 100 consecutive patients undergoing elective lumbar spine surgery. At the time of surgery, the patients were randomized to one of two widely used, and FDA approved, surgical skin-preparation solutions: 1) ChloraPrep or 2) 3M™ DuraPrep Surgical Solution (Iodine Povacrylex [0.7% available iodine] and Isopropyl Alcohol, 74% w/w) Patient Preoperative Skin Preparation. Aerobic and anaerobic cultures were obtained prior to skin preparation (pre-prep), after skin preparation (post-prep), and after closure (postclosure). A validated neutralization agent/sampling solution was used for each culture to ensure that the antimicrobial activity was stopped immediately after the sample was taken. Positive cultures and specific bacterial pathogens were recorded.

**Results:** Coagulase-negative *Staphylococcus, Propionibacterium acnes*, and *Corynebacterium* were the most commonly isolated organisms prior to skin preparation (Figure 1). The overall rate of positive cultures prior to skin preparation was 82%. The overall rate of positive cultures after skin preparation was 0% (0 of 50) in the ChloraPrep group and 6% (3 of 50) in the DuraPrep solution group (p=0.24). There was an increase in positive cultures after wound closure, but there was no difference between the ChloraPrep (34%, 17 of 50) and DuraPrep solution (32%, 16 of 50) groups (p=0.22). Body mass index (BMI), length of surgery, and/or estimated blood loss did not show statistical significance with post-closure negative/positive culture rates.

**Conclusions:** ChloraPrep and DuraPrep solution are equally effective skin-preparation solutions in eradicating the common bacterial pathogens found on the skin overlying the lumbar spine. There were a significantly higher number of overall positive culture results following wound closure, but no difference between the groups. This suggests that there is significant contamination that occurs during the course of surgery, and that sterile technique, administration of peri-operative antibiotics, and the use of an impregnated drape play a role in preventing infection.

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