

Aqueous Versus Alcohol-Based Skin Antisepsis Before Surgical Fixation of Open Fractures: A PREP-IT Individual Patient Meta-Analysis

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Purpose: Skin antisepsis remains a vital component in prophylaxis against surgical site infection (SSI); however, for open fractures it is unclear whether aqueous or alcohol-based solutions should be preferred. The purpose of this study was to indirectly compare the use of aqueous and alcohol-based skin antisepsis solutions, using data from the PREP-IT trials (A-PREP and PREPARE), on the risk of SSI following surgery for an open fracture.

Methods: Individual patient data from 2 cluster-randomized clinical trials were combined to create 1 data set of patients undergoing surgery for an open fracture. A regression model was used to analyze the effects of an aqueous or alcohol-based solution, as well as for potential interaction of chlorhexidine or iodine as the primary agent. The primary outcome was SSI within 90 days, and the secondary outcome was unplanned fracture-related reoperation within 1 year.

Results: 3338 patients undergoing surgery for an open fracture were included in the final analysis, with 1638 receiving an aqueous solution and 1700 receiving an alcohol-based solution. Overall, the use of an alcohol-based skin antiseptic solution did not reduce the risk of SSI at 90 days (odds ratio [OR] 0.99, 95% confidence interval [CI] 0.66-1.48, $P = 0.95$), or the risk of unplanned reoperation at 1 year (OR 0.98, 95% CI 0.75-1.28, $P = 0.88$). Planned subgroup analysis also found no significant difference in risk of SSI or unplanned reoperation when patients were stratified by Gustilo-Anderson type, fracture location, or primary ingredient of the skin prep solution (chlorhexidine vs iodophor).

Conclusion: This analysis found that there was no evidence of any difference in the risk of SSI or reoperation when comparing aqueous and alcohol-based skin preparation solutions. Furthermore, while this analysis demonstrated no harm to using an alcohol-based solution for open fractures, the PREPARE trial found that for closed fractures skin preparation with 0.7% iodine povacrylex in 74% isopropyl alcohol had a reduced risk of SSI. Given these findings, surgeons should consider treating all fracture patients with 0.7% iodine povacrylex in 74% isopropyl alcohol to streamline policy with a single skin antiseptic for all fractures.