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Column Editor

Chlorhexidine Wipes

The New Weapon Against Surgical Site Infections?

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I am a certified nurse specialist working in busy surgical services for a 500-bed medical center. Increasingly, I am hearing more and more about chlorhexidine wipes as an alternative to traditional skin preparation for surgery. What is the most recent evidence supporting the use of this product? Is there a significant difference between chlorhexidine solution and cloths for skin preparation?

Surgical site infections (SSIs) are the third most common nosocomial infection in hospitals. Associated with SSIs are increased costs as well as readmissions for increased morbidity and mortality. Infections range from superficial, limited to skin and subcutaneous tissues, to deep infections, where soft tissue and fascia are affected. Deep infections can extend to organ spaces and ultimately become systemic rather than localized events.[1,2]

Skin preparation reduces risks of infection. However, patient and procedural factors post significant risks as well. Increasing age, poor nutrition, diabetes, and obesity increase the risks of infection. Also increasing the risks are the length of the surgical procedure, preoperative surgical team antisepsis of hands and forearms, surgical technique, and hair-removal technique. Finally, the choice of antibiotic and the timing of drug delivery seem to significantly impact patient outcomes.[1,2]

CHLORHEXIDINE

Chlorhexidine is a topical antimicrobial agent and a primary ingredient in nearly 50 products including oral rinses, pellets, creams, lotions, foams, gels, sprays, dressings, and ointment mediums. Once absorbed by the microbial cell walls, chlorhexidine destroys cell membranes, which prevents the development of bacterial resistance because the rupture of cell membranes causes leakage of intracellular contents.[3]

Indications for use include reduction of pocket depth in adult periodontitis, scaling and root planning dental procedures, prevention of dental caries, wound and skin decontamination in the critically ill, hand hygiene, and catheter site preparation and care.[3]

Currently, there are more than 40 clinical trials examining the outcomes and/or efficacy of chlorhexidine for a variety of conditions including dental plaque, gingivitis, oral candidiasis, SSIs, neonatal mortality, puerperal infection, HIV infection, Methicillin-resistant Staphylococcus aureus and vancomycin-resistant enterococci colonization, sepsis, urinary tract infection, catheter-related infection, nosocomial bacteremia, systemic inflammatory response syndrome, and pneumonia.[4]

CHLORHEXIDINE SKIN ANTISEPSIS—2 REPORTS

For a product to be labeled as a preoperative skin preparation, the Food and Drug Administration requires that treated skin sites cannot have microbial rebound growth greater than baseline measure at 6 hours after the application of the agent. Evidence suggests that chlorhexidine skin antisepsis is preferred to traditional preparation of povidone-iodine solutions because of its persistent and longer-lasting antimicrobial properties.[1,5]

In one review of 6 clinical trials spanning a 9-year period (1983–1992) with 10,007 patients, outcomes for antiseptic versus nonantiseptic full-body bathing before invasive procedures were examined (Cochrane database).[2] No clear evidence was found to support preoperative showering or bathing with chlorhexidine over other products in the prevention of SSIs. However, weaknesses in research design, including lack of clinically relevant end points, limited participant follow-up, and failure to control for antibiotic use, suggest type 2 error.[2]

A recent powerful study compared the antimicrobial activity of 2% chlorhexidine gluconate (CHG)–impregnated preparation cloths against that of preparation cloths liberally applied with 4% CHG solution used in inguinal and axillary sites where there is high colonization of microbes. Thirty participants were randomized to receive

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Reprinted from *Clinical Nurse Specialist: The Journal for Advanced Nursing Practice*, March/April 2008 - Volume 22 - Issue 2 - pp 61-62.

1 of the 2 treatments with cultures at baseline, 10 and 20 minutes, and 6 hours after application. Microbial reduction was compared with the baseline measure. For every period after skin preparation, microbial counts were significantly less for areas treated with the 2% CHG cloth compared with the traditional 4% CHG solution preparation ($P < .01$).[6]

Significant controls built in this clinical trial encourage the acceptance of the findings. Participants with diabetes, hepatitis, autoimmune dysfunction, organ replacement, or implants were excluded. In addition, participants using antibacterial soaps, deodorants, or powders; hot tubs; swimming pools; or ultraviolet tanning beds were excluded. Participants were not to bathe or shower 48 hours before baseline sampling. Finally, the participants did not shave in the 5-day period before sampling.[6]

The 2% CHG-impregnated cloth appears to be a practical and effective product for inpatient and outpatient settings. For patients who have a difficult time bathing as directed for surgical procedures, the CHG wipe may be an effective alternative.[6] Finally, the microbial reduction related to cloth characteristics and the interaction with the skin independent of CHG remain unknown.

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Reprinted from *Clinical Nurse Specialist*: *The Journal for Advanced Nursing Practice,* March/April 2008 - Volume 22 - Issue 2 - pp 61-62.