The use of chlorhexidine for preoperative bathing or showering is an agent at least the night before the operative day to eliminate residual and transient microbes in the study population. The Cochrane review came to this conclusion by evaluating the literature on the efficacy of its use as a preoperative skin antiseptic. This study was a prospective, randomised study with a total cohort of 24 subjects (6 males; 18 females; median age of 39, ranging from 30 to 58 years). All subjects used both products to eliminate any variations that might be caused by skin type, dressing techniques, etc., between subjects. The study was comprised of two groups: Group A (n=12) and B (n=12).

**METHODS**

**CHG Prepping Protocol**

4% CHG rinse-off solution: On Day 1 of the study, subjects were instructed to use a standard washcloth and 4% CHG rinse-off solution provided: subjects were instructed not to use regular soap after 4% CHG rinse-off solution use.

2% CHG no-rinse cloths: On Day 8, both groups did not shower, but instead wiped down entire body with three packages (total of 25 CHG cloths per package) of 2% CHG cloths provided. Subjects used 1 cloth to wipe each of the following areas for ~30 seconds each: neck, chest and abdomen; arms; left leg and foot; right leg and foot; buttck and genitals; back. Each area was allowed to dry for 1 minute, did not rinse; instructed not to use any lotions, moisturizers, or perfumes.

**CHG Testing**

At the time of testing, the 2% CHG cloths and the 4% CHG rinse-off solutions were weighed to determine how much product had been used. Sampling for Group CHG residual was performed 1 and 8 hours after washing in Group A (morning prep). Sampling for Group B (night before and morning of) was done 3 hours after the morning wash. A 4" x 4" swab was moistened with 10 ml of sterile water and used to擦拭skin with neutral pH; 1" diameter for 10 seconds. Sampling sites included the abdomen, behind each knee, and the left and right lower back.

**RESULTS**

Is there a difference in the amount of CHG residual on the skin after use of the 4% CHG solution compared to the 2% CHG cloth? There was no correlation between the amount of 4% CHG solution used and the residual amount left on the skin (correlation coefficient 0.58, P=0.0001).

Is there a difference in the amount of CHG residual on the skin of patients with Staphylococcus aureus surgical site infection? The amount of CHG used during prepping with 4% CHG solution and 2% CHG cloth was comparable. There was no statistical difference in the amount of CHG after the application of CHG solution compared to the 2% CHG cloth.

Is there a difference in the residual CHG left on the skin when the 4% CHG solution is used compared to the use of the 2% CHG cloth? In both groups, the 2% CHG cloth subjects had more residual CHG on their skin than the 4% CHG solution subjects.

Is there a difference in the residual CHG left on the skin after one or two preps with the 2% CHG cloth compared to the 2% CHG cloth? Two preps with 4% CHG solution showed no more residual CHG than one prep (P=0.37).

Is there a difference in the CHG residual left on the skin at three hours and ten hours after the use of the 4% CHG solution compared to the 4% CHG rinse-off solution? Group A subjects were tested on Day 1 and Day 8 at 3 hours and ten hours post-prep. There was no change in the amount of CHG detected on the skin at three hours and ten hours for 4% CHG solution (P=0.64) or the 2% CHG cloths (P=0.16).

**CONCLUSIONS**

This study was done to determine if there is a difference in the amount of residual CHG left on the skin when prepping with a 4% rinse-off application of CHG compared to that of a 2% no-rinse application. The amount of CHG that remains on the skin after a no-rinse application is significantly higher than a CHG application that is rinsed off. This finding indicates that most of the CHG is likely rinsed off the skin during or after the application of the product, leaving very little CHG on the skin. This could contribute to the efficacy of the no-rinse CHG cloths as compared to the rinse-off product.

A higher residual CHG quantity is attained by prepping twice with the 2% CHG cloth, whereas the 4% CHG solution shows no additional residual quantity after the second prep.

Difference in residual CHG between sample sites may reflect more difficulty in prepping certain body parts. The significant difference of the amount of residual CHG detected when comparing sample sites may be due to the quality of prepping certain body areas, such as behind the knee. Therefore, especially for total knee patients, instructions to the patient need to highlight the importance of paying special attention to this area during pre-surgery skin preparation.

**REFERENCES**


Improving Skin Antisepsis: 2% No-Rinse CHG Cloths Improve Antisepsis Persistence on Patient Skin Over 4% CHG Rinse-Off Solution

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**OVERVIEW**

The Centers for Disease Control (CDC) guidelines for prevention of surgical site infections (SSIs) published a category IB recommendation as follows: “Require patients to use of chlorhexidine for preoperative bathing or showering is an agent at least the night before the operative day to eliminate resident and transient microbes in the study population.” It is well known that harmful bacteria, such as methicillin-resistant Staphylococcus aureus and vancomycin-resistant Enterococci, attach to mortally, extended length of stay, and significant costs. Chlorhexidine is proven to kill these and other harmful bacteria.” Chlorohexidine gluconate (CHG) is an FDA-approved skin antiseptic available in a 4% solution that is rinsed off after use in a bath or shower (4% CHG solution) and an alcohol-free 2% CHG impregnated no-rinse cloth (2% CHG cloth). Recommendations, such as the above CDC recommendation, strongly recommend the use of an antiseptic agent at least the night before the operative day to prevent harmful bacteria; however, a large Cochrane review found the “use of chlorhexidine for preoperative skin preparation or bathing or showering is unlikely to prevent surgical site infection.”

The Cochrane review came to this conclusion by reviewing the results of studies which utilized the 4% CHG solution. Residual CHG at the site of application may influence the efficacy of its use as a preoperative skin antiseptic. This study was designed to compare and evaluate the delivery of the CHG to the skin by the following skin cleansing and preparation products: 4% CHG solution (Hibiclens®; Midylech) and a 2% CHG cloth (Sage 2% CHG Cloth; Sage Products Inc, Cary, IL, equivalent to 500 mg chlorhexidine gluconate per cloth).