



New method for assessing hand disinfection shows that pre-operative alcohol/chlorhexidine rub is as effective as a traditional surgical scrub

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ARTICLE INFO

Article history:

Received 13 January 2014

Accepted 17 June 2014

Available online 24 July 2014

Keywords:

Alcohol/chlorhexidine solution

Surgical scrub

Pre-operative hand disinfection

McKenzie method



SUMMARY

Background: Several studies have shown that rubbing hands with an alcohol/chlorhexidine solution provides equivalent microbial decontamination to a conventional surgical scrub using aqueous chlorhexidine. However, the authors believe that these studies have methodological flaws that limit their applicability to the operating theatre environment. As such, a method was developed to compare products in an everyday operating theatre environment using working operating theatre personnel.

Aim: To determine whether or not an alcohol/chlorhexidine rub is as efficacious as a traditional surgical scrub using a novel method.

Methods: Bacterial counts at baseline were collected from 20 anaesthetists using the glove juice method. Subsequently, with sequential exchange of sterile gloves, one hand underwent a 3-min scrub using 4% aqueous chlorhexidine, and the other hand underwent a 60-s rub with a 70% isopropyl alcohol/0.5% chlorhexidine solution. The residual bacterial count was collected for each hand after 30 min using the glove juice method. These counts were converted to \log_{10} values to compare the baseline counts of right and left hands, and efficacy between the treatment groups.

Findings: Mean [\pm standard deviation (SD)] bacterial counts at baseline were (\log_{10}) 4.42 ± 0.81 for left hands and 4.64 ± 0.60 for right hands ($P > 0.05$). The mean (\pm SD) reduction from baseline was (\log_{10}) 1.45 ± 0.50 for 4% chlorhexidine and 2.01 ± 0.98 for alcohol/chlorhexidine ($P > 0.05$).

Conclusion: An alcohol/chlorhexidine hand rub was found to be as efficacious as a traditional scrub after 30 min; this study differs from previous work as it was undertaken in a population of practising anaesthetists in their working environment. The McKenzie method allows baseline and study evaluations to be performed contemporaneously on the same individual. Each subject was his/her own control. This method offers a more clinically relevant way to compare disinfectant solutions than standard methods.

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Introduction

Could an alcohol-based hand rub replace a conventional surgical scrub for hand disinfection for sterile procedures associated with anaesthesia? Alcohol rubs have been shown to reduce hand preparation time by two-thirds,¹ and several studies have shown an alcohol chlorhexidine-based preparation to be equivalent or superior to aqueous chlorhexidine in terms of ability to reduce skin bacterial counts.^{2–4}

However, these studies, as well as current US⁵ and European⁶ hand disinfection guidelines, have potential methodological flaws that may limit their applicability to a working operating theatre environment. These include the need for test subjects to adhere to stringent conditions for days before the studies,^{3,5,6} performing baseline studies on a different occasion from test studies,^{2–5} and testing the products for comparison on a different occasion in each subject.^{2–6}

As such, a novel method – the McKenzie method – was developed to compare the products in an everyday operating

theatre environment using working operating theatre personnel. With this method, subjects have no special preparation, the test solutions are compared at the same time using sequential glove changes, and the subjects act as their own control.

Methods

The study received approval from the Princess Alexandra Hospital Ethics Committee.

Participants

Twenty volunteers who were either anaesthetic consultants or registrars gave consent to participate in the trial. Exclusion criteria were the use of antibiotics in the preceding seven days or significant skin damage on the hands, such that the use of alcohol-based products would be considered painful.



Baseline testing using glove juice method

Sequentially isolating hands

Perform normal duties for 30 min, then collect sample using glove juice method



Figure 1. McKenzie method.

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