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## **IS A HAND SCRUB BY SOAP AND WATER OR BY BETADINE MANDATORY BEFORE SURGERY?**

**Abdul Ghany Al-Dabbagh**

D.S., FRCS (Ed.), FRCS (Glas.), Assistant Professor, Department of Surgery, University of Babylon College of Medicine and Consultant Surgeon, Hilla Teaching Hospital, Hilla; IRAQ.

### **Summary**

One thousand two hundred and forty swabs were taken from hands of surgeons and assistants in different theaters after vigorous scrubbing by brush with soap and water alone or betadine (as disinfectant). All swabs were cultured to assess for microorganism contamination. The study showed that there was no much difference between those three methods of disinfection after 3 minutes scrubbing. Data were analyzed statistically using Chi-square test. The calculated statistical values were tested on the level of significance of ( $p < 0.05$ ).

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### **Introduction**

**H**and scrub before surgery in theater has been used as a traditional method of disinfecting the hands of the surgeon and assistants alike.

Since the introduction, in the 1970s, of a surgical hand scrub formulation that contained 4% chlorhexidine gluconate, new surgical scrub formulations, that have improved efficacy, were produced<sup>1</sup>.

The effect of soap alone in reducing hand bacterial counts at 4-5 minutes was similar to that of soap and brush<sup>2</sup>. Disinfection by using soap and water affect the wall of the bacteria and other

microorganisms. This finding suggests that 2 minutes surgical hand scrub with brush is clinically as effective as three minutes surgical scrub<sup>3</sup>. With the use of novel formulary technology unique moisturizing hand gels have been developed that offer significant advantage because frequent hand washing causes skin damage, especially using a brush, with resultant changes in microflora (microorganism like *E.coli*) forming colonies in the main fascial layers and sweat gland of the human skin.

Many microorganisms like *Staphylococci*, *Streptococci*, *Pneumococci* and *E. coli* live on the skin and make colonies on the human skin, sweat gland and sebum.

Although vigorous scrubbing with soap and water or other disinfectants as in

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#### **Correspondence to:**

Dr. Abdul Ghany Al-Dabbagh  
Department of Surgery, College of Medicine,  
University of Babylon, IRAQ.

preparation for surgical operation, will temporarily rid the skin of most of its surface microorganism, five protocols for surgical hand washing (scrubbing) were evaluated for their efficiency of removal of microorganism and their drying effect on the skin<sup>6</sup>.

Throughout this prospective study, we want to shed a light on the significance of a hand scrub before surgery with use of brush or without using it.

## Material and Methods

In our study 1240 swabs were taken from hands of the surgeons and assistants (720 swabs for males and 520 swabs for females). The swab was taken from the hands of the surgeons and assistants in the theater of Hilla Teaching Surgical Hospital and all these swabs were sent to the laboratory of the same hospital for culture. In our study, we use the 3 major protocols for disinfection that is soap and water only, soap and water with brush for 3 minutes or washing with 10% betadine for 3 minutes

Chi square test was applied to measure the level of significance with the use of P value <0.05.

## Results

The results of this study are shown in figure 1 as we divided the total into 3 groups: the first group included 300 swabs that were taken after use of the betadine (10%), the second group included 440 swabs that were taken after use of the brush with soap and water and the third group included 500 swabs that were taken from the hands of the surgeons and assistants after washing them with soap and water only for 3 minutes.

## Discussion

Hand washing (scrubbing) by soap and water with the use of brush for 4-5 minutes was the traditional method for disinfection of the hands of surgeons and assistants in the 1970s. The introduction of the disinfecting agents 4% charo-hexidine reduced scrubbing time to less than 3 minutes.

Staph.aureus produces variable toxins found in skin and sweat glands on nasal and other mucous membrane<sup>8</sup>.

Although vigorous scrubbing with soap and water or other disinfectants as in preparation for surgical operations will temporarily rid the skin of most of surface bacteria, those sequestered in hair follicles and sweat glands will soon reestablish the surface infection by gram positive aerobic cocci<sup>9</sup>.

The study runs through a collection of 1240 swab from the hands of surgeons and assistants in different theaters in Hilla Teaching Hospital as shown in figure 1. The highest number of swabs was 500 swabs (40.3%) taken from hands scrub by soap and water only, i.e. without the use of brush, from which 13 swabs were proved to be infected (2.6%) by Staph.albus and Psuedomonus spp.

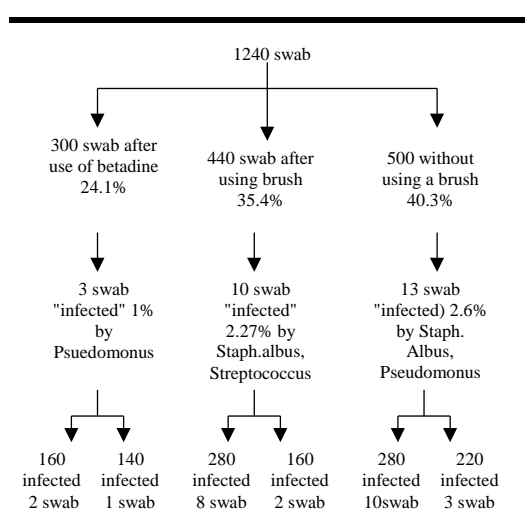


Figure 1.

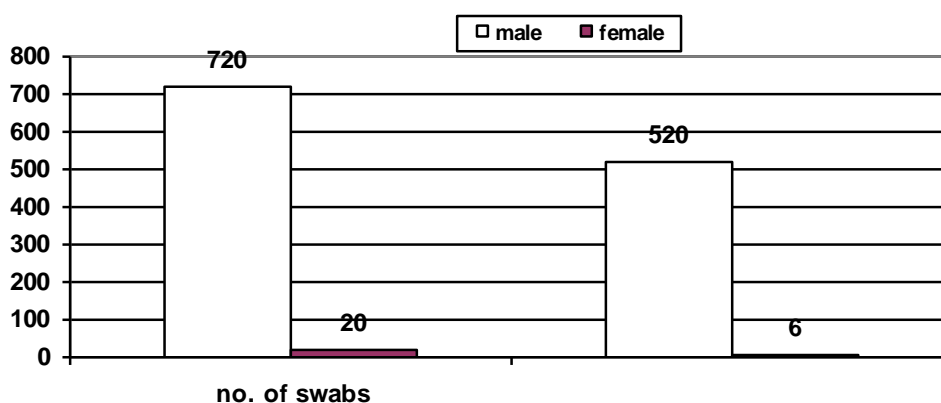
Using the brush with soap and water for 3 minutes in 440 swabs (35.4%)

resulted in 10 (2.27%) infected by *Staph.albus* and *Streptococcus*. On the other hand, among the 300 swabs (24.1%) taken after scrubbing by betadine, only 3 swabs (1%) proved to be infected by *Psuedomonus* spp.

Also the infection was found to be more in the male hands than female

hands, possibly because males harbor hair more than female in their hands, this is show in figure 2.

It is concluded that no significant difference exists between the three methods as the chi-square and the p value consistently showed (p value <0.05).



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