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Review Article

Hand washing and hand hygiene in medical practice and day to day life

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ABSTRACT

Hand washing and hand hygiene are very important things to remember in the hospital practice as well as daily life. Hand hygiene can be performed by soap or hand sanitizer. Hand hygiene can lead to drastic reduction in transmission of infections and also drug resistant bugs, and is thus also a good way to combat AMR or antimicrobial resistance in the community as well as in hospital setting. Hand hygiene can be maintained by hand washing or hand scrubbing, and both these things are important, depending on the hospital setting. Hand wash can be social, surgical and antiseptic. Hand hygiene can also be made more popular in the masses by a number of methods and educational activities. Compliance to hand hygiene among people is not always very great, even among the healthcare providers, and this should be a matter of concern. Hence hand hygiene assumes some importance, and is now considered a "do-it yourself vaccine". This topic is discussed less but is very important.

1. Introduction

Hand hygiene is now widely recognized as the most important factor for controlling nosocomial infections, drug- resistant infections and their cross transmission.[1] Our hands are dirty at times and can transmit many pathogens to patients which can lead to devastating infections. Hand hygiene can be performed either by soap or alcohol-based hand sanitizer.

There are six or seven steps of hand hygiene.[2] Proper stepwise handwashing can lower the prevalence of certain respiratory and gastrointestinal infections by up to 23% and 48%, respectively. It can also substantially lower the cases of Coronavirus infections. In fact, physical distancing, handwashing and vaccination have been the 3 pillars in controlling the COVID pandemic. In common parlance, it is not always possible to follow these steps of hand hygiene sequentially, however whenever possible they should be followed. In many cases hand washing with soap eradicates germs better than hand sanitization or scrubbing. This is especially true in case of food borne viruses like norovirus. In case of visibly soiled hands, germs are eradicated better by hand washing with soap, rather than hand sanitization.

There are two kinds of soaps that can be used for hand washing; one is a non medicated soap and the other one is medicated soap. Medicated soaps can contain chlorhexidine or chloroxylenol. Both the types of soaps can be solid or liquid; it is better to use liquid soap which covers the creases of the palms of the hand better. Nowadays powdered soaps in sachet are also available, that need to be reconstituted in specified volume of water for hand washing. In any kind of hand wash, hand should be washed for a minimum time of 25 to 30 seconds stepwise (first, hands to be moistened, soap taken, the rubbing from palm to palm, dorsum to palm, in between fingers, interlocking fingers and thumb, nail tips in palm, wrists).[3]

In case of hand scrubbing or hand sanitization, it should be carried out with an alcohol-based hand sanitizer that

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should also contain emollients like glycerol or vitamin E or aloe Vera. The latter things are added to prevent the drying up of skin of hands. As regards the alcohol used in the hand sanitizers, Isopropyl alcohol has better microbicidal property than ethyl alcohol. The effective concentration is 40% to 70% in cases of both ethanol and isopropanol. The sanitizers are effective only when the alcohol is evaporated fully. Sometimes hydrogen peroxide or chlorhexidine an be added to hand sanitizers. A minimum amount of 2 ml of liquid soap or sanitizer is needed for hand washing and scrubbing, respectively.

While performing hand sanitization rings should be removed from fingers and nails should preferably be kept short.

2. Source of Bacteria in Hands

Bacteria and yeasts in hands come usually from picking external nose or from unclean and unhygienic practices, or by touching dirty objects. The bacteria flora in hands can of 2 types: transient flora and resident or permanent flora. Only the transient hand flora can be removed by hand washing.

3. Types of Bacteria Found in Hands

Commonly Staphylococci, Enterococci and Candida spp. are found in the hands of the healthcare giver. We did several experiments and found similar results. Hands of nurses and attendants are slightly more contaminated than those of doctors.

4. The Five Points of Hand Hygiene

There are 5 points of hand hygiene, or that hands should be washed at 5 points or junctures:

1. Before touching a patient,
2. Before clean/aseptic procedures,
3. After body fluid exposure/risk,
4. After touching a patient, and.
5. After touching patient surroundings.

They are also called the 5 moments of hand hygiene. They are very important to remember for the healthcare giver.

5. Advantage of Hand Sanitizer over Soap

A hand sanitizer takes less time than soap and water, and is also less irritating to the skin.[1] However, soap and water lead to better eradication of germs. In particular, anaerobic spore bearing bacteria and norovirus are better eliminated by soap and water than alcohol-based sanitizer. Also, medicated soaps are better than non-medicated soaps in this aspect.

6. History of Hand Hygiene

The foundation of hand hygiene was laid down by Joseph Lister and Ignaz Semmelweis. In Vienna in the year 1846, Ignaz Semmelweis recorded that he could reduce the incidence of postpartum infections by hand wash with chlorinated lime water.[4] From then onwards, hand hygiene became an important recognized factor to control infections. However, even before that, Labarraque postulated that hand hygiene can bring down significantly the instances of puerperal fever and maternal mortality.[5] Joseph Lister was a surgeon who used a spray made or carbolic acid on instruments before surgery, and also used to clean his hands with it before the procedures, with great success in reducing post-operative infections.[6] He published his findings in the year 1867.

6.1. Which product to select for hand hygiene

This depends on the cost, antimicrobial profile of the soap or sanitizer and also user acceptance.[1] Such a product must have at least bactericidal, fungicidal (can kill yeasts), and virucidal (against enveloped viruses) activity.

7. Types of Hand Washing

There are 3 types of hand washing: social hand washing, antiseptic hand washing and surgical hand washing.[7] Surgical hand washing is done up to elbow while social hand washing is done till wrist. Antiseptic hand wash is a process which also kills the resident bacteria of skin. It is performed with hot water and antiseptics.

In normal day to day life, social hand washing is better and more relevant, especially before eating and after defecation.

7.1. How to remember the duration of hand washing

People can hum the "Happy Birthday" song from beginning to end twice to cover the period of 25 to 30 seconds for hand hygiene.[2]

7.2. How to increase awareness among masses about hand hygiene

Compliance to hand washing or sanitization is low, even today, right from the era of Semmelweis. Convincing health care providers to contemplate hand-washing seriously is an arduous task even today.[4] This adherence or compliance is about 30-40% even in healthcare providers. Social media and educational activities can be planned for educating the masses about the significance of hand hygiene. Hand hygiene day or other such commemorative days can be envisaged in order to highlight or emphasize the importance of hand hygiene which is a seemingly simple measure but has great implications in breaking the chain of transfer of infections. Global Public-Private Partnership

for Handwashing with Soap (PPPHW) has coined October 15 as Global Handwashing Day.[8] Sensor-based no-touch hand sanitizers with dispenser are now available and used in many healthcare facilities.[9] It uses infrared-ray based motion sensors and dispenses sanitizer within about 0.2 seconds. They can be accompanied by a poster or signage displaying the steps of hand washing. Handwashing training and educational posters and videos also help in making people more aware of steps and importance of hand hygiene, as has been demonstrated in children.[10] Hand hygiene is now all the more relevant in the wake of transmission of drug- resistant infections.

8. Discussion

Hand hygiene is often neglected but is an important step for infection control. In fact, hand hygiene is a very simple way to mitigate hospital associated infections, prevent the spread of antimicrobial resistance, and enhance patient safety.[11] Healthcare givers should be more compliant towards proper hand washing. General people should be made aware about the steps and importance of hand washing. Only then proper infection control can be achieved, particularly in the hospital setting. Handwashing is also termed a "do it yourself" vaccine, and handwashing with soap after visiting the washroom and before eating is the most effective and inexpensive means to prevent the death of millions of children due to diarrheal and respiratory diseases.[8]

9. Conclusion

Stepwise hand hygiene by soap or hand sanitizer is needed to break the chain of transmission of infections. Awareness need to be generated among the masses about the significance, moments and steps of hand hygiene, to halt the chain of infection transmission, more so since not many new antibiotics are coming up to tackle drug-resistant bugs.

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11. Conflict of Interest

None.

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