

Overview of Sanitizer Usability in COVID-19 Pandemic Scenario

Vishal Bawankar¹, Gaurav Sawarkar²

¹Intern Student, Mahatma Gandhi Ayurved College, Hospital and Research Centre, Datta Meghe Institute of Medical Sciences (DU), Wardha, Maharashtra, India, ²Associate Professor Department of Rachana Sharir, Mahatma Gandhi Ayurved College, Hospital and Research Centre, Datta Meghe Institute of Medical Sciences (DU), Wardha, Maharashtra, India

Abstract

Hand cleanliness is the most significant thing as it might be tainted effectively from direct contact with microorganisms. In the circumstances of COVID-19, its essential to intrude on the chain of the infection with the use of appropriate hand cleaner. The motto is accomplished by keeping up excellent hand cleanliness in emergency clinic settings and indoor and outdoor patient departments. The compelling hand purification relies upon the utilization of legitimate hand cleaning operators defined in different sorts and structures, for example, alcohol-based hand sanitizer, antimicrobial cleansers and so on. However, frequent utilization of sanitizer or ill-advised usage of antimicrobial operator prompts show a reaction to human well-being. This orderly audit corresponded with the information accessible in the literature search. It is exploring available hand disinfectants and their effectiveness just as the antagonistic effects and there are some suggestions to get the upgrade for the human well-being.

Keywords: Alcohol, Antimicrobial, Hygiene, Sanitizer.

Introduction

It is antimicrobial, which irreversibly inactivates and kill near about 99.9% of bacteria, viruses and fungi present on a surface. It is available in the form of liquid, gel, or foam. There are two types of sanitizers i.e., Alcohol-based and Alcohol-free. Alcohol-based sanitizers may contain various types of alcohol. It applied on the surface to irreversibly inactivates or kill bacteria, viruses and fungi present on a surface. It acts quickly and effectively on microbes and destroys it without needing water. But its effect is for short duration

and not so active on protozoa, bacterial spores and non-lipophilic viruses.^[1] Alcohol-free sanitizer made from chemicals which has antiseptic properties. It is safer to use, especially among children, because they are not inflammable and prepared at low concentrations.^[2,4]

Alcohol-based sanitizer contains ethanol, isopropanol, N-propanol, hydrogen peroxide, other type sanitizer contains chlorhexidine, chloroxylenol, iodine, iodophors, quaternary ammonium compounds, triclosan^[5,7]

Alcohol-based sanitizer contains either n-propanol, ethanol, or isopropanol. The optimum bactericidal activity required a concentration of 60 to 95 % of alcohol^[8,9]. It dissolves the lipid membranes of microbes and also deprived the natural qualities of the proteins in it. They have broad-spectrum antimicrobial activity against enveloped viruses (HIV, herpes simplex virus, etc.), fungi, bacteria (Mycobacterium tuberculosis, etc.). Routine use of alcohol-based sanitizer manifests dryness, redness, cracks, etc. In rare conditions, it causes blisters that cause itch and pain. Hydrogen peroxide

Corresponding Author:

Dr. Gaurav Sawarkar

Associate Professor Department of Rachana Sharir, Mahatma Gandhi Ayurved College, Hospital and Research Centre, Datta Meghe Institute of Medical Sciences (DU), Wardha, Maharashtra, India
e-mail: drsawarkar.gaurav@gmail.com
Phone: 8956977899

acts as antiseptic and comes in different concentrations according to the purpose of its uses. 3% for household, 6 to 10% for hair bleaching, 90% for industrial purposes. It is effective against bacterial spores found in raw materials were ethanol, isopropanol, or n-propanol based sanitizer ineffective. They have side effects as eye irritation, vomiting, bleaching of the hair or skin. It required handling with caution during production due to its corrosive nature. [10]

Chlorhexidine destroyed cytoplasmic membranes, which leads to precipitation of cell contents. [11] It is highly effective against gram-positive bacteria and show moderate action against gram-negative bacteria and enveloped viruses [12]. It is cationic and avoids using soap and cream, which contain anionic agents as they cause inactivation and reduce efficacy [13]. Chlorhexidine gluconate 0.12% have antiviral activity against the coronavirus [14] and they are having side effects like redness, itching, severe burning or irritation.

Chloroxylenolis used as an antimicrobial agent in soap or as a preservative in cosmetics. It can alter cell wall synthesis in microbes by deactivating enzyme systems. It effectively destroys bacteria and enveloped viruses but is less effective against *Pseudomonas aeruginosa* [15,16] and has side effects such as skin rash, angioedema, itching and redness.

Iodine or Iodophorsis an effective antiseptic. It can penetrate the cell wall of microbes and impaired the synthesis of cellular components. It causes discoloration and irritation of skin [17]. It has polyvinyl pyrrolidone, which acts as a polymer carrier and improves the iodine solubility with sustained release. So, the irritation of skin lessened [18].

Quaternary ammonium is related to nitrogen atom i.e., acetylperidium chloride, benzethonium chloride, benzalkonium chloride. Thus, causing leakage of the constituents' act by adsorbing to the cytoplasmic membrane. They are effective against lipophilic viruses and gram-positive bacteria. [19] but may irritate the skin.

Triclosanis bacteriostatic at low concentration, but with high intensity, it destroys bacterial membranes. It is more actively work on gram-positive bacteria. Its efficacy affected by pH, ionic nature of individual skin formulations and use of emollients but causes dermatitis and allergic reaction. [20].

Worldwide use of sanitizer: The development of

the COVID-19 pandemic is spread worldwide and it is generally concerned for well-being and hence prompted for broad utilization of disinfectants [21,22]. COVID-19 is an irresistible illness brought about by SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2), which survive on various surfaces around nine days [23,24]. Transmission of SARS-CoV-2 is conceivable as vaporized and fomite. The infection can stay feasible and irresistible in pressurized canned products for a considerable length of time and on surfaces up to a few days [25]. Consequently, it is essential to interfere with the chain of transmission through the disconnection of communicable things and the intervention of disease controlling instruments [26]. Regular use of face mask and shield covers, suitable hand cleaners are significant to avoid direct contact with patients.

By any means, respiratory droplets encourage the transmission and increase the chances of infection [27-29]. The 2003 extremely intense SAR Soutbreak was brought about by a novel human coronavirus that survived 24 to 72 hours [30]. The investigations on this episode indicated that efficient hand washing and cleanliness at offices decreased transmission [31]. Consequently, the government advanced and energized hand cleanliness through handwashing or utilizing hand sanitizer [32]. Hand disinfectants are accessible in different kinds and structures, such as alcohol-based hand sanitizers, hostile to microbial cleansers and so forth utilized in medical clinic settings. WHO recommended alcohol-based hand sanitizer on account of fast activity and a wide range of antimicrobial action offering insurance against microbes and infections [27,33,37].

Effect of sanitizer: The most generally revealed skin responses with the utilization of alcohol-based sanitizer are aggravation contact dermatitis and unfavorable susceptible contact dermatitis [38,39]. The side effects of aggravation contact dermatitis can go from gentle to crippling with signs like dryness, erythema, pruritus and dying, if severe. Concerning unfavorably susceptible contact dermatitis, the indications may restrict extreme types of contact dermatitis in case of respiratory trouble or other side effects [40,41]. Occasionally, it might not be so easy to recognize the kind of dermatitis because of the cover and likenesses of side effects. Hand cleanliness items, for example, sanitizer and cleansers can be harming to the skin through a few instruments: change of intercellular lipids, denaturation of the layer corneum proteins, decrease of layer corneum water-restricting limit and decline in corneocyte union [42,43]. The greatest

worry is the consumption of the lipid obstruction, particularly with repeated use of lipid-emulsifying cleansers and lipid-dissolving alcohols for progressively visiting colonization of microscopic organisms, might be entered into the layers of the skin and tends to change the flora^[44-46]. Among the alcohol-based sanitizers, ethanol has minimum skin-damaging properties^[47]. Alcohol-based sanitizers had hand drying property, which can break the skin^[48]. Then again, unfavorably susceptible responses towards specific operators are noted with chlorhexidine, iodophors, chloroxylenol, triclosan and alcohols. People with hypersensitive reactions to alcohol-based disinfectants may have genuine sensitivity to alcohol or sensitivity to aldehyde metabolite or different chemical aroma, parabens and benzyl alcohol

Solutions to minimize side effects of sanitizer:

The antagonistic effects brought about by sanitizer can be handily anticipated by distinguishing with the triggering and countering factor with suitable strategies like saturating skin after hand sanitation, choosing items with a less disturbing specialist and evading tendencies that may cause or bother skin aggravation. At the point when continuous hand purging is regular, for example, among social insurance laborers, it is desirable over select items having a decent harmony between effectivity, well-being and similarity with various types of skin. Only worries about drying effects of alcohol and similar effects might delay the acknowledgment and extreme utilization of sanitizers. Subsequently, to decrease this issue, alcohol-based sanitizer containing emollients can be utilized. Considering the temperature and moistness as significant supporters for dermatitis, the maintenance of skin moistness is more extended in tropical nations and areas with relative humidity compared to cold and dry conditions. This perspective requires a changing need of emollients concerning separate natural terms and atmospheres as indicated by topographical regions. A few people who are regularly wearing gloves, are prone to develop dry skin condition. So, these persons recommend using lotions containing fats and oils to upgrade skin moisture.

Discussion

Appropriate hand cleaning with alcohol-based sanitizer is one of the standard procedures to forestall immediate or unusual spread of the COVID-19 as it lessens the quantity of virus infection on dirty hands. As per literature search, five occasions are identified where

hand cleanliness should be monitored: when having direct contact with patients, before taking care of obtrusive gadgets for understanding consideration, after contact with body fluids, waste or discharges, before, during and after contact with clinical machines inside vicinity and beginning of any procedure where aseptic precautions are required. The researchers suggested that washing the hands with cleanser at whatever point is conceivable because handwashing diminishes the measures of a wide range of germs and synthetics on sides. On the off chance that cleanser and water are not accessible, utilization of a hand sanitizer at any event ethanol or isopropyl alcohol deactivates infections like COVID-19. The time to time handwashing can precisely expel the microbes; however, the expulsion of resident pathogenesis is progressively successful when cleanliness is preferably done through competent microbial experts, as per WHO health policy suggestions length for the whole handwash system ranges between 20 to 40 seconds with the advance method. Nearly, sanitizer with 60% alcohol is more effective in devastating the microorganisms than other handwash. The alcohol-based handwash may not be comparably effective in case of messy or oily hands, so handwashing with cleanser and water is favored under certain conditions.

Conclusions

Legitimate hand cleanliness is one of the standard disease control methodologies as it can verifiably bring down the probability of immediate transmissions of microorganisms. The utilization of alcohol-based hand sanitizers is becoming increasingly regular because of their quick activity and efficiency in slaughtering microbes. For the most part, handwashing utilizing cleanser and water isn't useful.

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