

'Fogging on Humans' a mean to disinfect SARS-CoV-2?

John Peter Smiles CIH, CSP

Assistant General Manager

Chola MS Risk Services Limited, Chennai

1.0 Background:

As virologist are working towards identifying various strands of SARS-CoV-2 a novel Coronavirus which cause Coronavirus Disease 2019 - COVID19, efforts on developing vaccination throughout the globe is making substantial progress. No other confirmed and documented preventive medicine exists for SARS-CoV-2 as on date. Agencies such as WHO, CDC and MoHFW have advised to follow 'Non-Pharmaceutical Intervention' along with disinfecting surfaces which could be the most important response strategy as on date.

Disinfection booth / tunnel (approximate dimension 9 feet x 9 feet x 5 feet) are rapidly emerging domestic market which are installed in public places where general public are advised to walk through the tunnel to get themselves disinfected. Lateral and Header pipeline installed inside the tunnel with spray nozzles fitted on the lateral pipeline at equidistance. 1% Sodium Hypochlorite Solution is claimed to be used as disinfectant in these tunnels.

The misapprehension on using 1% Sodium Hypochlorite as disinfectant on Humans along with other similar disinfectants and the toxicological effects are discussed in this article.

2.0 Infection Control Strategy:

Various international health agencies have published such that transmission of SARS-CoV-2 virus spreads predominantly through respiratory droplets from person to person. Enough studies needs to be established to confirm transfer of virus from potentially

contaminated surface to the unaffected persons. Certain studies have suggested that SARS-CoV-2 virus may remain potent on various materials from hours to days. However, details on how long the air inside a room occupied by SARS-CoV-2 virus will potentially be infectious have not been documented.

With the given uncertainty on contact with surface is currently unknown and possibility of prolonged infectious potency in contaminated surface leads to a decision on higher infection rates. Hence, cleaning the floor / surfaces of objects and applying disinfectant on such surfaces have been on priority list to reduce and mitigate the risk.

Currently there is no published results on the disinfectants over anti-microbial specific tests against SARS-CoV-2 virus. Hence, the claim of "Clean and Disinfect" to be replaced with "Clean and Apply Disinfectant". It is a reality that microbial reduction has not been established for specific disinfectant to confirm that the surface has been "Clean and Disinfected". However, with given scenarios of potent dwell of SARS-CoV-2 virus on various material surfaces disinfectant are being recommended to potentially prevent spread of SARS-CoV-2 virus.

3.0 Publications on Disinfectant use over potentially contaminated surface (Not on Human surface):

None of the below publications emphasis on the use of 1% Sodium Hypochlorite Solution or specific solutions for disinfecting on human body.

3.1 Ministry of Health and Family Welfare has issued a guideline on disinfection of common public places including office, where 1% Sodium Hypochlorite solution shall be used for disinfecting indoor surface areas by mopping with linen / absorbable cloth while the worker shall wear appropriate Personal Protective Equipment to avoid inhalation and dermal exposure.

3.2 Centers for Disease Control and Prevention (CDC), USA has published detailed disinfection guidance document. The guideline is more focused on 'high touch surfaces daily in house hold / community common areas' through cleaning and disinfecting. EPA registered disinfectant (List N) for use against SARS-COV-2 virus shall be used on Hard (Non-porous) house hold surfaces. CDS recommends at least 1000 ppm Sodium Hypochlorite can be used as appropriate for the surface. For Soft (Porous) Surfaces, Electronic gadgets and clothes alternate disinfectants as listed in List N to be used at the specified concentration or alcohol based wipes for disinfection for electronic gadgets and warm water for potentially contaminated clothes. For personal hygiene and other preventive measures, CDC recommends for washing hands with soap and water for 20 seconds and if such facility not available then alcohol (at least 60%) based disinfectant shall be used. It shall be noted that Sodium Hypochlorite at any specific concentration has not been recommended for disinfection on human body.

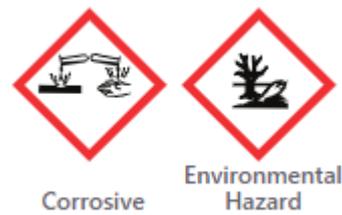
3.3 World Health Organization has specified their recommendation for disinfectants such as 70% Ethyl Alcohol to disinfect reusable dedicated equipment, 0.5% (5000 ppm) Sodium

Hypochlorite for frequently touched surfaces.

It shall be noted that Sodium Hypochlorite at any specific concentration has not been recommended for disinfection by on human body.

4.0 Toxicology of Sodium Hypochlorite

Global Harmonized System (GHS) classification



Causes skin burns and eye damage on higher concentration.

Inhalation will cause severe bronchial irritation and pulmonary edema. Can be irritating if contacted with skin and eyes.

National Centre for Biotechnology Information through HSDB states inhaling Sodium Hypochlorite aerosol to be avoided. Bodily contact with Sodium Hypochlorite should be avoided. Symptomatology extends to inflammation, erosion of mucous membranes, edema of pharynx..

5.0 Exposure Limits

Workplace Environmental Exposure Level (WEEL): Short-Term Exposure Limit (STEL) is 2 mg/m³, 0.66 ppm

6.0 Alternate fogging / fumigation / disinfectant available for human surface

There is no active ingredient as disinfectant specific as an aerosol to be safely used over human body. Environmental Protection Agency (EPA) has listed Hydrogen Peroxide using Binary Ionization Technology, however it

is not meant for exposing humans during the fog / mist application.

Currently the best approach to disinfect is washing with water and soap for 20 seconds or with alcohol based disinfectant. Contaminated cloths shall be washed with water at temperature of more than 60 deg C or use appropriate disinfectant.

7.0 Conclusion:

1% Sodium Hypochlorite solution can be used as disinfectant on hard/soft material surface. However, the same shall not be used for fogging / fumigating / disinfecting humans considering its toxicological properties. Substantial research papers available could not be traced on the said application to confirm that the anti-microbial disinfectant could limit the exposure of SARS-CoV-2 virus on human body.

8.0 Reference:

[https://www.mohfw.gov.in/pdf/Guidelineson disinfectionofcommonpublicplacesincludingof fices.pdf](https://www.mohfw.gov.in/pdf/Guidelineson%20disinfectionofcommonpublicplacesincludingoffices.pdf)

<https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/cleaning-disinfection.html>

<https://www.who.int/news-room/q-a-detail/q-a-on-infection-prevention-and-control-for-health-care-workers-caring-for-patients-with-suspected-or-confirmed-2019-ncov>

<https://pubchem.ncbi.nlm.nih.gov/source/hsdb/748#section=Human-Health-Effects>

<https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>

<https://www.ttl.fi/en/cleaning-guidelines-for-the-prevention-of-covid-19-infections%E2%80%AF/>

Rule of 10 – Qualitative Exposure Assessment – AIHA - A strategy of assessing and Managing Occupational Exposure

Disclaimer:

Views, thoughts, opinion expressed in this article on 10th April 2020 belongs solely and personally to the author, and not necessarily, to the views of author's current or previous employer, organization, and committee or other groups or individuals. Anyone using this document should understand the documents limitation and rely on his / her professional judgment, as appropriate. He / she shall remain updated on SARS-CoV-2 virus, disinfection methodology, as well as adhere to local regulations.