

Efficacy of Medetech's Medecide™

It is well known that bacteria can persist on the inanimate surface for a prolonged time, but viruses can persist on the surface from few hours up to months. Surfaces can become contaminated by hands, objects, bodily fluids, sneezing, and coughing (aerosol). Therefore, surfaces in any health care facilities, including clinical labs, play a crucial role in transmitting the diseases. ^{1,2} Despite the higher prevalence rate of viral outbreaks and hospitals and labs being the primary transmission source of viruses, limited studies have been conducted on disinfectants' efficacy. Hospitals have "high-touch" environmental surfaces (HITES)³ in critical areas.

Similarly, labs or COVID-19 testing sites should also be considered HITES. Therefore, careful cleaning and disinfecting the surfaces in those facilities is essential. A wide range of disinfectant products is available, including no-touch technologies with self-disinfecting surfaces such as vaporization of the peroxides, electrolyzed water copper, or silver. However, manually wiping surfaces especially pre-impregnated wipes, with the disinfectant solution is the most preferred method used in the health care settings.⁴ Virucidal effect of the disinfectant wipes is still unclear as most work is done on bacteria or fungi. Until now, there was no European Norm (EN) measuring the virucidal effect of wipes existed. Appropriate disinfectant claiming the virucidal efficacy would help to reduce nosocomial virus infection.

COVID-19, a disease caused by the novel Coronavirus SARS-CoV-2 (previously 2019-nCoV), is circulating worldwide. The Coronavirus outbreak started in 2019, an epicenter in the Hubei province of the People's Republic of China. According to Fauci, Lane & Redfield (2020)⁵, the Coronavirus pandemic has massively changed different generations' businesses included. An epidemic that has resulted in disruptions, continual upheavals, and global shifts in ends linked to technology transformation, digitalization, and geopolitics transformations and business model evolution has facilitated the introduction of collective calluses to curb its uncertainties. The pandemic has caused devastation and countless casualties, including patients and health care workers. Droplets and hands play a crucial role in transmitting the virus, and thus far, face shield, face mask, and proper hand hygiene are among essential infection control tools. SARS CoV-2 can persist on surfaces for up to 4-5 days and can be easily transferred from the surface to the hands. According to the World Health Organization, a standard disinfectant should suffice the need to clean the surfaces effectively, but there is a lack of evidence. This study aimed to test the efficacy of the Medecide™ against the SARS CoV-2 compared to the commercial products with chlorine bleach that are available in the market.

Materials

Treatment surface: Carpet, Ceramic, Cardboard, Plastic, Steel, Tile, Wall, and Wood.

Medetech's Medecide™ solution, a surface disinfectant, was tested against the SARS CoV-2. The product is formulated with biodegradable compounds known as Haloimidazolidinones and was obtained from LHIC, Inc and P3 Shield, LLC.

The Sofia SARS Antigen FIA kit and Sofia 2 instrument qualitative detection of the SARS CoV-2 manufactured by QUIDEL corporation was used. The kit contained Reagent tubes with reagent solution:

- Lyophilized buffer with detergents and reducing agents
- sterile nasal swabs
- SARS positive control swab-coated with non-infectious recombinant SARS antigens
- Negative control swab - coated with heat-inactivated
- non-infectious Streptococcus C antigen
- Small, Clear 120 µL Fixed Volume Pipettes
- Individually Packaged Test Cassettes with Monoclonal anti-SARS antibodies
- Ampoules with a salt solution

Biohazard disposable bags and containers.



Drug



Alcohol



DNA



Wellness



LabTests



Background

Methods

Sample Preparation

The SARS-CoV-2 positive control was stored at room temperature (degree). The analysis was performed at the ARCpoint Labs in Virginia Beach. The efficacy of the disinfectant was analyzed for two methods of applications: air-dried and wiped. On the sterile surface of steel, carpet, wood, plastic, cardboard, tile, wall, and ceramic, SARS CoV-2 was lathered on each surface with the help of a swab. Medecide™ P3 shield disinfectant was sprayed on the treated surfaces. For the air-dry treatment, samples were left untouched and were collected using the sterile swab at 0 hr, 24 hr, 72 hr, 5 days, 7 days, 18 days, and 22 days. Whereas for the wiped surface, treatment surfaces were wiped off with the paper towel. To test whether the wiping step disinfected the surfaces without leaving any residue, surfaces were swabbed similarly at 0 hr, 24 hr, 72 hr, 5 days, 7 days, 18 days, and 22 days. All tests were performed in triplicates; for each experiment, SARS CoV control was included. Sample surfaces were placed with the virus suspension were stored under standard laboratory conditions.

Test Procedure

Dispense all of the reagent solutions into the Reagent Tube. Swirl the Reagent Tube to dissolve its contents. Place the swab collected from the treated surfaces into the reagent tube. Roll the swab at least three times while pressing the head against the Reagent Tube's bottom and side. Leave the swab for 1 minute in the reagent tube. Remove the swab while squeezing the swab head to the side of the tube, just pressing away. Dispose of the swab in the biohazard container. With the provided Small, Clear 120 µL Fixed Volume Pipette, place the patient sample from the Reagent Tube into the Test Cassette. Discard the Pipette in your biohazard waste. Wait for 15 minutes and then insert the cassette into Sofia 2 dock machine. Follow the prompt on the screen and tap on the read now button to get the result. Results will be displayed in positive (+) or negative (-).

Results

Table 1-Anti-virulence (SARS CoV-2) properties of surfaces treated with Medecide™ solution (Air-dried)

Duration	0 hr	24 hrs	72 hrs	Day 5	Day 7	Day 18	Day 22	Day 30
Treatment Surface								
Carpet	Neg	Neg	Neg	Neg	Neg	Pos	Neg	Neg
Ceramic	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg
Cardboard	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg
Plastic	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg
Steel	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg
Tile	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg
Wall	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg
Wood	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg

Table 2- Anti-virulence (SARS CoV-2) properties of surfaces treated with Medecide™ solution (Wiped)

Duration	0 hr	24 hrs	72 hrs	Day 5	Day 7	Day 18	Day 22	Day 30
Treatment Surface								
Carpet	Neg	Pos	Neg	Neg	Neg	Neg	Neg	Neg
Ceramic	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg
Cardboard	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg
Plastic	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg
Steel	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg
Tile	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg
Wall	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg
Wood	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg



Drug



Alcohol



DNA



Wellness



LabTests



Background

All Medecide™ solution coated fabric and hard surfaces showed biocidal efficacy against the SARS-Cov-2 agent. Over the 30 days, surfaces treated with Medecide™ formulation showed a higher persistence of antivirulence efficacy. Based on the 0 hr reading, the formulation is beneficial as it deactivated the virus upon contact. Medecide™ formulation was allowed to sit on the treated surface and thus had more time to deactivate the virus; however, wiped surfaces showed similar results. The wiping step did not remove the disinfectant coating from the surfaces allowing persistence to deactivate the SARS CoV-2 agent. Two outliers were noticed at 24 hr (wiped) and at day 18 (air-dried) from the carpet (fabric) surface and have been reported in Tables 1 and 2.

Discussion

Overall, the Medecide™ disinfectant showed higher efficacy against the SARS CoV-2 agent than the chlorine bleach (6000 ppm) formulation available in the market. The study conducted by Medetech science showed that the effectiveness of 10% sodium chlorite (chlorine bleach) at 6000 ppm declined 30 minutes later, whereas the Medecide™ disinfectant was significant at 28 days. This could have explained the persistence result for 30 days; however, a detailed study on the Haloimidazolidinones compounds is required.

Reference:

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