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Disinfectants for use in the sanitary context of COVID-19

Desinfetantes para uso em contexto sanitário de COVID-19

Desinfectantes para uso en el contexto sanitario de COVID-19

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The novel coronavirus (SARS-CoV-2) is a virus identified as the cause of an outbreak of respiratory disease first detected in Wuhan, China. The World Health Organization has defined the disease caused by this variant of the virus as COVID-19. Coronavirus belongs to a large family of viruses, common in different species of animals, including camels, cattle, cats, dogs, and bats. Rarely, coronaviruses can infect humans and then spread to people as it occurs in Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS).[1]

Person-to-person spread occurs mainly through respiratory droplets produced when an infected person coughs or sneezes, similar to the way influenza and other respiratory pathogens spread.[2] When sneezing, the droplets with the virus can reach people who are nearby and are deposited on surfaces as well, which can become a source of contamination.

Coronavirus studies have shown that they can survive on surfaces for hours to days, depending on temperature and humidity. Although the level of surface contamination in the presence of COVID-19 is not known, studies with other epidemiologically important pathogens have shown that hygiene leads to decreased transmission.[3] No wonder that, when implementing standard precautions to control transmission, the following are recommended, among others: frequent hand hygiene with soap and water or alcoholic preparation, as well as cleaning and disinfecting objects and surfaces touched frequently.[1-2]

It has as scientific research data that there is not a single chemical disinfectant compound, or antiseptic, which is ideal for all contexts in problem situations in healthcare environments. Various chemical compounds are available for use, and the choice depends, among other factors, on the type of microorganism.

It is then necessary to decide on the criteria for choosing a disinfectant to be used in a coronavirus emergency. Reference can be made to the (criterion) recently used by the US

Centers for Disease Control and Prevention (CDC),[4] whose logic is based on the recognition that microorganisms can be classified in relation to their sensitivity, tolerance or resistance to chemical disinfectants (that is, Spaulding classification model). With this approach, we have the classification in order of the most susceptible to the most resistant: lipid virus (that is, enveloped or of medium size, for example the coronavirus); vegetative bacteria (for example, *Staphylococcus aureus*); fungi (for example, *Candida*, *Aspergillus*); non-lipid (this is, non-enveloped) or small viruses (for example, poliovirus, rhinovirus); mycobacteria (for example, *Mycobacterium tuberculosis*); coccidia (*Cryptosporidium*); and the most resistant spores (for example, *Clostridium difficile*).[5-6]

SARS-CoV-2 is an enveloped virus. Therefore, the CDC's recommendation is that if disinfectants inactivate more resistant microorganisms (for example, mycobacteria and non-enveloped viruses) than coronaviruses, they are expected to inactivate COVID-19,[3-4] and that a product registered on List N of the Environmental Protection Agency (EPA) be used.[7] In this list, there are products of which the most frequent active ingredients are sodium hypochlorite, dichloroisocyanuric, ethanol, quaternary ammonia group, hydrogen peroxide, and peracetic acid.

In Brazil, disinfectants with potential for use on surfaces are defined as those based on chlorine, alcohols, some phenols, iodophores, and quaternary ammonium compounds. It is recommended to clean the surfaces with neutral detergent followed by disinfection with one of these disinfectant solutions or another disinfectant standardized by the health service, as long as it is regularized with Anvisa, emphasizing the use of 70% alcohol and chlorine.[1-2]

However, it is necessary to warn that many studies have shown that the efficient disinfection of surfaces requires not only an efficient product, but also an efficient practice.[3] In this sense, it is necessary to reinforce concepts that guide the techniques and practices used in hygiene. Hygiene is a procedure adopted with two distinct stages: cleaning and disinfection. Cleaning refers to the process of removing dirt and residues present on the surface. This process precedes disinfection because among the limiting factors of the action of chemical compounds on microorganisms present on surfaces is organic matter (feces, urine, blood...). It serves as mechanical protection, preventing disinfectants from coming into contact with bacteria, fungi, or viruses.[5] Or even, as in the case of chlorinated compounds, consuming the active chlorine.[8] The disinfection is intended to act on the microorganisms remaining on the surfaces, after cleaning.

Another important concept to remember is that of decontamination.[9] This procedure is adopted to, using a disinfectant, reduce the microbial load before cleaning, in order to make surfaces in general, that of utensils and equipment safer for handling. It is a procedure that has great sanitary importance, but it is necessary to observe the techniques of its use taking into account the presence and quantity of organic matter. Other factors that cannot be disregarded on the efficiency of disinfectants relate to the concentration of use and the contact time (of operation). About this procedure, hygiene techniques and other guidelines can be accessed in the "Patient Safety Manual: cleaning and disinfecting surfaces", published by Anvisa and available at the link http://portal.anvisa.gov.br/documents/33852/271892/Manual%2Bde%2BLimpeza%2Be%2BDesinfec%C3%A7%C3%A3o%2Bde%2BSuperf%C3%ADcies/1c9cda1e-da04-4221-9bd1-99def896b2b5

In conclusion, it appears that SARS-CoV-2 is a virus that can be inactivated, in compliance with good hygiene practices, by various disinfectant chemical compounds. It is considered inappropriate to restrict the disinfection procedure to just two, however important they may be, such as alcohol and chlorine, which has led, in this period of coping with the COVID-19 pandemic, to shortages in one case, and to misuse in the other.

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