The mouthwash that deactivates the coronavirus

In crisis situations you have to keep an open mind. Washing your hands with soap is known to prevent the transmission of enveloped viruses, such as coronavirus. So why not use a soap in your mouth, where the virus concentrates during the initial days of infection?

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The mouth is an important source of infection and transmission of SARS-CoV2. Therefore, it is essential to reinforce oral health care to prevent the transmission of Covid-19. And this is what the team led by **Nuria Izquierdo-Useros**, a researcher at IrsiCaixa, has tried to find out through a preclinical study carried out on cells grown in the laboratory, the objective of which was to demonstrate the antiviral effect of certain mouthwashes with **Cetylpyridinium chloride** (CPC), a molecule present in some oral antiseptics. Specifically, according to her data which can be found on the **bioRxiv** website, this component is capable of reducing the infectious capacity of SARS CoV-2 in laboratory cell cultures by up to 1,000 times.

“From an epidemiological standpoint, having a mouthwash that lowers the viral load of people infected by the coronavirus would be very positive news to prevent the transmission of the virus. **Because it is known that the lower the viral load, the less risk of contagion**, says the investigator. “Our first step”, Izquierdo-Useros explains to ABC, “was to try to find out if the mouthwashes were capable of blocking the entry of the virus into the cells. "It is believed that some agents in mouthwashes can act like soaps by breaking the membrane of viruses and thus preventing their infectivity."

Her team analysed CPC, which was suspected of having this action on the membrane of some viruses, not only of SARS-CoV-2, but also influenza.

"Our surprise was that when we did the test with the laboratory pseudoviruses - modified viruses - we saw that the presence of CPC in the mouthwash inhibited the entry of the virus."

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The next step was to see if it worked with a real virus. The investigators tried to mimic what a person does when rinsing their mouth. "**We took coronavirus isolated from a patient and exposed it to a mouthwash that did or did not contain CPC and let it act for 1 minute**. Later we used these viruses to infect cells and we observed that they were not capable of infecting new cells. Somehow it had a virucidal effect. Coronavirus is an enveloped virus and its membrane is a sort of Achilles heel common to many enveloped viruses.
The mouthwash, she explains, acts like soap and dissolves those membranes: that's the mechanism of action. "What CPC does is break the virus membrane", highlights the investigator.

"Taking into account that in our experiment we used a greater amount of virus than that found in the oral cavity of infected people, these results are very encouraging," she asserts.

What CPC does is break the virus membrane

This information is quite significant because it could be used to contain many enveloped viruses, not just SARS-CoV-2, and to reduce infections and prevent transmission.

The data have been so positive that they have initiated a clinical trial, started two weeks ago, which will be carried out on 140 subjects divided into two groups of 70 people each.
This is a double-blind, randomised, parallel, placebo-controlled clinical study, which will be led by Bonaventura Clotet and Oriol Mitjá, from IrsiCaixa.

"We have selected patients with SARS-CoV-2 of less than 4 days, because it is the period in which there is the greatest amount of virus in the upper respiratory tract," she comments.

The investigators will collect samples before and after the use of mouthwash to see if the virus changes and diminishes.

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Viral load is known to be the most important factor in the likelihood of transmitting the infection. The higher the viral load, the greater the ability to infect. "**If there is an effective, simple and accessible method of reducing the amount of virus, during this period, we would have the possibility of reducing the risk of infection**," says Izquierdo-Useros.
The use of CPC is also being studied in nasal sprays, because the nose is also where the virus concentrates.

"That idea is remarkable and simply because there is a possibility that it can be used in all parts of the world and on all kinds of people it is a very attractive idea," she concludes.