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Opinion

Gain Health from a Smile

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Prevention is always the best treatment and everyone agrees it is necessary. Just as the vaccine is needed to fight the pandemic. In addition to the vaccine, there are other ways to protect against viruses and bacteria. In this pandemic emergency many more people have learned to wash and sanitize their hands frequently. This correct behavior should be combined with an additional act of prevention simple and easy for everyone: rub teeth, gums and mucous membranes with a wet gauze (even if only with saline solution). It will certainly prevent tooth decay, gingival inflammation and tooth loss, and above all, it will help to improve overall health.

The oral cavity is harboring over 700 species of bacteria and including also fungi, viruses, and protozoa [1]. An oral microbiome dysbiosis and periodontal inflammation impacts on numerous pathophysiological mechanisms. The evidence-based literature provides clear evidence of the association between oral health conditions and numerous systemic diseases, such as cardiovascular disease, diabetes, rheumatoid arthritis, asthma, hepatic diseases, Alzheimer's, and even tumor of distant organs in cancer patients.

The scientific societies organize congresses on these important topics, voluminous tomes are written, articles of ascertained scientific and editorial value are published, and the most important experts release interviews. Nevertheless, in non-dental contexts these concepts seem unknown to most individuals [2-4].

A rinse, with any mouthwash, is not enough to remove the biofilm, but scrubbing maneuvers are necessary. A young survivor could live a long life on a desert island, free of tooth decay and gingival inflammation, simply by carefully rubbing teeth and soft tissues with a cloth shred and seawater. Home care performance is the most significant factor in impacting oral health, consequently affecting many systemic conditions.

Concerning the current pandemics by SARS-CoV-2, the presence of gingival inflammation/periodontitis has been associated with a 3.5-fold increased risk of intensive care admission and 4.5-fold greater risk of assisted ventilation and death (8.81) of COVID-19 patients, independently from other concomitant risk factors [5].

Hence, these data suggest that a neglected oral hygiene might increase the likelihood of severe COVID-19, facilitating effective virus replication and penetration in the deep respiratory tree and worse course of the disease, whereas proper oral hygiene may be an important factor for infection control.

A preliminary *in vitro* study was conducted at the University of Ferrara, showing that a simple 30-second scrubbing of teeth performed with wipes used to dislodge oral biofilm can also remove viruses from the teeth surface [6].

Extracted teeth were artificially contaminated with 50 µl of virus solution, containing 10^6 - $10^{8.5}$ $TCID_{50}$/ml of human enveloped viruses (namely the human coronavirus CoV-229E, structurally superimposable to SARS-CoV-2, and the human herpes simplex virus HSV-1, frequently detected in the oral cavity), allowed to dry and then treated with chlorhexidine 0.12% soaked (Digital Brush, Enacare, Micerium,

Avegno, GE, Italy), or saline-soaked wipes (Digital Brush Babby) [6]. Notably, no infecting virions could be detected on the teeth surface following 30 seconds of scrubbing, with both type of wipes, suggesting that simple scrubbing maneuvers could be indicated to remove SARS-CoV-2 together with the intraoral biofilm. Chlorhexidine in addition allowed 99% inactivation of the removed viruses, contrarily to saline-soaked wipes [6]. The results thus indicate that a regular use of wipes for biofilm removal could be effective in virus removal, potentially having a double effect: i) avoiding further penetration of the virus into the deeper airways in the infected subject, ii) reducing the emission of contaminated droplets, potentially limiting the risk of contagion. Extending also the rubbing to the eyes and nostrils would potentially prevent the risk of infection through the lacrimal ducts and nasal mucosa.

Further *in vivo* studies proving the efficacy of viral removal by rubbing maneuvers are highly expected, to assess the effectiveness of such procedures. However, these preliminary results highlight the potential of mechanical biofilm removal from teeth surface as a tool toward the SARS-CoV-2 infection control. Proper oral hygiene may be important and should deserve adequate priority in COVID-19 control strategies, also in light of the ease of use, low costs and absence of contraindications [7].

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