

Commentary

Are the Guidelines for Surgical Dental Cares Suitable for COVID-19 Pandemic?

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Commentary

During pandemic events (HIV, COVID-19, etc.) and when there are no adequate therapeutic resources, the application of preventive guidelines is important to minimize the spread of infection [1]. Furthermore, this is important to reassure the population, pay more attention to vulnerable patients and stabilize the mood in the overly concerned population. In this social context it is also important to provide medical and dental

assistance through safe dental treatments. After the apparent pandemic reduction, individual anxieties and economic and social uncertainties remain high. Requests for dental care have significantly decreased (for prostheses, oral surgery, endodontics and restorations) mainly due to uncertain and insufficient insurance coverage and the high costs of dental therapies [2]. A recent survey of over 2,000 people from July 2020 shows that 40% of respondents said they did not feel safe in the dental practice during routine checkups or dental cleanings. Furthermore, 36% of respondents do not believe that dentists can control or stop the spread of COVID-19 [3]. The population has

changed the priorities of health needs, including for dental treatments. This is in line with the fact that dental patients require concrete operational safety for the prevention of any infection [2, 4-6].

Today, more than ever, all dental facilities must make infection prevention a priority and guidelines indicate the need to strictly adopt standard precautions, especially based on viral transmission. This procedural objective is fundamental for an adequate reopening of dental services. A recent Cochrane review reports on national recommendations for the re-structuring and reopening of dental services from 11 countries [7]. Unfortunately, this document and other international sources present highly variable details and procedures with a lack of univocal operational objectives that can demonstrate reasonable effectiveness. Obviously, in the event of a new pandemic situation, some recommendations will derive primarily from the characteristics and biological plausibility of the infectious agent (i.e. the SARS-CoV weakness to oxidants and pre-rinse mouthwashes) and from preventive and therapeutic experiences with other infectious diseases (SARS-Co-V, MERS, influenza). Therefore, the world dental community is rapidly gathering useful information to adequately structure the first methodological recommendations [8]. The "better prevention than cure" approach and the precautionary principle justify the adoption of rigorous and severe preventive measures for COVID-19 infection, even if scientific consensus may not yet have been reached and codified [9]. Up to now, guideline recommendations suffer of knowledge gaps regarding:

- SARS-CoV-2 transmission by both small and large particle aerosol [10]
- Lung and oral virus load and viral aerosol emissions in the early stages of disease or

asymptomatic patients [11]

- SARSCoV-2 stability and viability in aerosol [12] and different ventilation conditions in dental settings
- Role of oral rinses in preventing the transmission of SARS-CoV-2 [13, 14]
- Features of PPE, methods of donning and doffing, and training of practical relevance to dentistry [7, 15, 16]
- Safety and operatory protocols for surgical dental care [17]
- The overall economic evaluations in relation to infective adverse events [18-20] and patient safety [21].

Then, guidelines are expected to change quickly with additional results in relation to cost/benefit and their critical revision is needed if COVID-19 will become endemic [22]. Nevertheless, we would like to underline that:

- The most frequent failing in infection prevention was poor hand hygiene and inappropriate glove use, which are standard precautions known to have high cost/benefit advantages [23, 24]
- The consequence of an COVID-19 outbreak would be a shock for pockets in or out of the courts for any dental facilities analogously with other reported outbreaks [25-27]
- It is difficult to prove an iatrogenic infection during COVID-19 pandemic; nevertheless, contact tracing (Italian Immuni App) and social media should put us on a grill [28, 29]

Recently, we and other authors discussed some problems which are going on during the application of guidelines [1, 22, 30-33] and their perspectives [22, 34, 35]. Others systematic review or meta-analysis began to

rank the effectiveness of the existing interventions to reduce aerosolized microbes [36]. Here, we would like to contribute to the discussion on limited guidelines on elective and non elective dental surgeries [37, 38]. The role of SARS-CoV-2 blood transmission still remains uncertain and could likely be low [39]. Indeed, viral transmission by aerosols would be a burning and particularly current problem [10, 12]. The proposed reclassification of Bizzocca is based on the probability of contagion by one or more infectious agents via saliva, blood, droplets or aerosols for the dental team, for the patient under treatment or for the subsequent patients, without considering the surgical and intrinsic operative difficulties. Therefore, surgical procedures (e.g. oral soft tissue biopsy, mucogingival surgery, exodontic surgery), operationally characterized by low or absent aerosol and droplet production, were considered not particularly dangerous [38].

We would like to underline that the CDC defines all dental therapies that produce aerosols are at high infectious risk, such as the therapeutic treatments in anatomical regions where the viral load may be higher (tongue, oral and pharyngeal-mucous membranes) [40, 41]. Rigorous infection prevention is recommended during elective craniofacial surgery [42-45]. Up to now, dental implantology (DI) and regenerative bone surgery (RBS) are considered non elective dental surgeries. We think that DI and RBS should be re-proposed to patients with attention for knowledge gaps regarding to:

- Devastating consequences in many tissues and organs of COVID-19 in older and the increased fatality rate after 50 yrs and patients with other medical co-morbidities [46]. It is well known that DI and RBS are requested mainly by patients elder than 50 yrs
- Lasting disabilities COVID-19 survivors will face

because of the combination of underlying chronic diseases, prolonged inflammation, and post-traumatic stress disorder [47]. Dental teams should be trained for medical emergencies [48]

- The immune response to COVID-19 [49, 50, 51]. The SARS-CoV-2 infection may decrease T lymphocytes, as well as IFN- γ production by CD4+ T cells [52]
- COVID-19 and smoking. Smoking increases SARS-CoV-2 receptors in the lung and this is rationally expected also in oral tissues [53]. Unfortunately, it is well known that smokers are particularly vulnerable to severe infections and dental implant loss
- If asymptomatic (pooled estimate of 16%) and paucisymptomatic patients or infected people without symptoms (75-100% of these people subsequently developed symptoms) or infected people who never developed symptoms (23%) could have an altered response to inflammation and coagulation [39, 54]. Our belief in relation to our clinical experience and bibliographic data, dental triage would not currently be able to differentiate asymptomatic or pre-symptomatic patients from unaffected individuals [33]
- Dental sedation precautions, recommendations and breath difficulties [55]
- The ACE2 receptor that is a cellular doorway for the SARS-CoV-2 entry and infection of cells. Nevertheless, ACE2/Ang-(1-7)/MasR is an active player in alveolar bone remodelling [56, 57]. Briefly, angiotensin II increases the osteoclastogenesis, while inhibit the osteoblastic activity leading to a decrease in bone mineral density
- The interactome between SARS-CoV-2 and host cell proteins, performed by Master Regulator

Analysis. It showed a very complex interaction ranging from surface enzymes (ACE2) to RNA-processing proteins (DDX5) to mitochondrial constituents (BCL2), up regulation of MCL1, a positive regulator of apoptosis, a highly regulated and programmed cell death [58], that is important for bone regeneration

In conclusion, better guidelines on infection prevention, studies focussed on the effects of the COVID-19 epidemic on RBS and recommendations for selecting patients before DI are welcome to avoid post-surgery clinical and legal troubles. Basic research using human organ models on chips for virology and dedicated to dentistry will be a formidable challenge of the future [59].

Declaration of Competing Interest

Livia Barenghi had a service agreement with KerrKaVo and was a consultant for DentalTrey il Blog (<http://blog.dentaltrey.it/>), neither of which gave any input or financial support to the writing of this article. The authors (Alberto Barenghi, Francesco Spadari, Aldo Bruno Gianni) declare that there are no conflicts of interest regarding the publication of this paper.

Author Contribution

Livia Barenghi: Conceptualization, Methodology, Writing - original draft, Writing - review & editing. Alberto Barenghi: review. Aldo Bruno Gianni: review. Francesco Spadari: Methodology, Writing - original draft.

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