Oral health and COVID-19

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REVIEW

INTERNAL MEDICINE

ABSTRACT: This article aims at collecting all information needed for dentists regarding the COVID-19 pandemic throughout the world by reviewing articles published by now. In late 2019, a pneumonia outbreak of uncertain etiology happened in Wuhan, China. There were many reports related to a live-animal and seafood market, supporting that the pathogens were transferred from animals to humans, rapidly evolving into transmission from human to human. The pathogen was classified as 2019 Novel Corona Virus (2019-nCoV), and the disease was named COrona VIrus Disease 2019 (COVID-19). Given that COVID-19 has lately been detected in infected patients' saliva, the COVID-19 outbreak is an alert that all dental and other health professionals must be vigilant in defending against the infectious disease spread, and it may enable to assess whether non-invasive saliva diagnostic for COVID-19. There has so far been no evidence from randomized controlled trials to prescribe any particular anti-nCoV treatment or vaccine, and COVID-19 management has been widely supportive. Since the ACE-2 was expressing on oral cavity mucosa, there is a potentially huge COVID-19 infectious vulnerability risk for oral cavity and brought up a proof for the future prevention procedure in dental practice and daily life. As a result, the whole dental teams should be vigilant and keep patients and themselves in a safe environment by following the guideline in this study.

Keywords: COVID-19, Epidemiology, Dentistry, Infection control

Introduction

In late 2019, a pneumonia outbreak of uncertain etiology happened in Wuhan, China. There were many reports related to a live-animal and seafood market, supporting that the pathogens were transferred from animals to humans, rapidly evolving into transmission from human to human. The pathogen was classified as 2019 Novel Corona Virus (2019-nCoV), and the disease was named COrona VIrus Disease 2019 (COVID-19) [1].

As of March 30, 2020, according to the World Health Organization (WHO), 2019-nCoV has involved 201 countries among which the most infected countries are shown in Table 1 [2]. This virus resulted in a mortality rate of 2% [3] and reproduction number (R 0) of 1.4–5.5 [4]

Coronaviruses belong to the Coronaviridae family including large, single, plus-stranded RNA as the genome [5], [6]. Coronaviruses are divided into four groups: alphacoronavirus, betacoronavirus, gammacoronavirus, and deltacoronavirus [7].

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The alphacoronavirus and betacoronavirus primarily infect the respiratory, gastrointestinal, and central nervous function of humans and mammals, while gammacoronavirus and deltacoronavirus mostly target the birds [5], [8], [9], [10].

Clinical presentations

Most COVID-19 patients are fairly mild cases. Based on the latest studies from the National Health Commission of China, the proportion of serious cases among the whole COVID-19 patients in China ranged from about 15% to 25% [14].

The common clinical symptoms of the patients suffering from COVID-19 are fever, cough, shortness of breath, myalgia (muscle pain), tiredness, and abnormal chest CT, and the less usual symptoms are headache, production of sputum, hemoptysis, stomach pain, dizziness, nausea, diarrhea, and vomiting. Some ENT (Ear, Nose, and Throat) doctors now believe that a distortion of the sense of taste (dysgeusia) and smell blindness (anosmia) could be considered as COVID-19 symptoms. Disease onset can cause progressive respiratory failure because of alveolar impairment and even death. [13], [15], [16], [17] Older age and the presence of underlying comorbidities such as hypertension, diabetes, cardiovascular and

cerebrovascular disease are commonly correlated with worse prognosis [18]. This new virus is also more probable to result in serious respiratory diseases in older males [19].

Besides, most patients' chest CT demonstrated bilateral pneumonia with ground-glass opacity (GGO) and bilateral patchy shadows as the most typical patterns [20].

Country	Total cases	Total deaths
World	693,282	33,106
USA	122,653	2,112
Italy	97,689	10,781
China	82,447	3,310
Spain	78,797	6,528

Table 1. Confirmed cases of COVID-19 statics as of March 30, 2020.

The impact of COVID-19 on oral health.

A study conducted in 2020 by Xu et al. and the findings showed that the ACE-2 was expressing on oral cavity mucosa and the receptor had been heavily enriched in tongue epithelial cells. Such results clarified the main reason that there is a potentially huge COVID-19 infectious vulnerability risk for oral cavity and brought up a proof for the future prevention procedure in dental practice and daily life. [15]

Receptors expressions of COVID-19 on epithelial cells of oral mucosa

In 2020, a study was conducted by Huaqiu Guo et al. [40] on 2537 dental patients. This research found that at the beginning of the COVID-19 outbreak, 38% fewer patients visited the dental offices. The findings highly recommend that COVID-19 greatly impacted dental patients' behavior and the distribution of dental disorders has drastically been altered. The proportion of dental and oral infections increased from 51.0% before the COVID-19 outbreak to 71.9% during COVID-19. The most frequent causes for patients' visits to the emergency room are dental pulpal or periapical lesions, and cellulitis or abscess. By reducing social activities, dental injury reduced from 14.2% to 10.5%. In the meantime, the non-urgency patients decreased by 70% compared to before COVID-19 outbreak. Thus, there is evidence to believe that in the post-COVID-19 era, people's demands for dental services may extremely rise.

Patient management and prevention of infection.

The American Dental Association proposed on March 16, 2020, that dentists defer all elective procedures and offer just the dental emergency treatment. [21]

- 1- Tele-screening

Primary telephone screening to recognize suspected patients or probable COVID-19 infection can be remotely done during scheduling appointments. Questions related to primary telephone screening could be any travel history to COVID-19 infected regions and the existence of febrile respiratory illness (FRI) symptoms such as cough and fever. A positive answer to any of these two questions would increase the initial concern and postpone the elective dental care for at least two weeks [22].

- 2- Patient assessment and care protocol

- Patients should fill out a comprehensive medical history form, a questionnaire of COVID-19 screening, and evaluation of a true emergency questionnaire.
- Dental practitioners should evaluate the body temperature of a patient via a non-contact forehead thermometer or cameras with infrared temperature sensors. Elective dental treatments for patients with a fever over 100.4°F (or 38 °C) and/or signs of respiratory disease should be postponed for at least 2–3 weeks.
- • Individuals with suspected COVID-19 infection will be seated in a distinct, well-ventilated waiting room at least 6 feet away from patients receiving treatment who are not infected based on the guidelines of the Centers for Disease Control and Prevention (CDC).
- Patients should wear a surgical mask and practice appropriate respiratory hygiene, for example, use a tissue to cover their mouth and nose when coughing or sneezing, and then throw the tissue away.
- Apply 70% ethanol to clean and disinfect the medical kits (blood pressure cuffs, thermometers, etc.).
- Advise the patients to do self-quarantining and inform their physician to avoid the COVID-19 risk. [1], [22]

- 3- Pharmacologic treatment

An option is a pharmacologic treatment by antibiotics and/or analgesics for suspected or confirmed COVID-19 cases who need immediate dental treatments for conditions such as swelling and/or tooth pain. This method may provide the relief of symptoms and give dental practitioners some time to come up with a plan to perform dental care to minimize the infection spread. The British Medical Journal prescribed acetaminophen as analgesia instead of ibuprofen for COVID-19 infected patients because ibuprofen can interfere with the immune system function [22].

- 4-Dental treatment guidelines

Some cases such as progressive fascial space infection or dentoalveolar trauma would certainly require emergency dental treatment. For suspected or confirmed COVID-19 cases, dental professionals should consider the following guideline: [1], [42], [23], [24]

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