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Letter to the Editor

COVID-19: its impact on dental schools in Italy, clinical problems in endodontic therapy and general considerations

Dear Editor

COVID-19 is a novel disease caused by a member of the coronavirus family that originated in Wuhan, Hubei, China in December 2019. Over the last few months, the infection has spread to several countries worldwide. Coronaviruses are described by the World Health Organisation (WHO) as a large family of viruses, which may cause illness in animals or humans (https://www.who.int/news-room/q-a-detail/q-a-coronaviruses). Although COVID-19 infections in humans most often present with mild symptoms, in a variable percentage of cases, it can cause an acute respiratory syndrome, which has led to patient fatalities (Phan 2020, Lu *et al.* 2020). COVID-19 appears to be a particular risk for patient with pre-existing medical conditions (such as high blood pressure, heart disease, lung disease, cancer or diabetes; https://www.who.int/news-room/q-a-detail/q-a-coronaviruses).

Recently, a letter has been published, detailing the potential impact of COVID-19 in Dentistry (Sabino-Silva *et al.* 2020), whilst other articles have set out the routes of transmission, implications and controls required in dental practice (Peng *et al.* 2020). In addition, various world, national and dental organizations have issued guidance, for example American Dental Association (http://success.ada.org/en/practice-management/patients/~/media/32D2D1F13B3D4D919E67CFBC00AF71B0.pdf), British Dental Association (https://bda.org/news-centre/latest-news-articles/Pages/Wuhan-novel-coronavirus-advice-for-dentists.aspx) and the WHO (https://www.who.int/news-room/q-a-detail/q-a-coronaviruses).

At the present time, the principle challenge is that the population has no innate protection against COVID-19 and a vaccine has not been developed. It is also of note that no specific antiviral therapy has currently proven to be effective against SARS CoV-2 (the virus causing the disease COVID-19). This combination of no vaccine as well as no effective therapeutic countermeasure is potentially leading to an unknown but possibly challenging scenario with millions of people becoming infected globally. This would inevitably have a major impact on daily life, with the potential to drive even the healthcare systems in developed countries to the brink of collapse.

Although the exact transmission routes are yet to be determined with certainty, as with influenza and many other viruses affecting the upper and lower respiratory airways, aerosol transmission between humans has been confirmed. The mean incubation period is estimated to be around 5 days (but probably ranges from 1 to 19 days), which allows travel to spread the disease globally (https://www.who.int/news-room/q-a-detail/q-a-coronaviruses). Interestingly, only a few paediatric cases have been reported, whilst in contrast, adult and older patients are frequently involved with some requiring hospitalization and even intubation within intensive care units (Rothan & Byrareddy 2020).

The clinical and virological evidence to date is not sufficiently robust to exclude the possibility that virus transmission can occur during the incubation period from infected but asymptomatic patients. Symptoms of COVID-19 are very similar to those of human influenza and include a fever, cough, rhinitis, myalgia, conjunctivitis and fatigue. From a European perspective, at least two separate clusters of infection have been identified in Northern Italy. The entire area of Italy is now a 'red zone' with multiple limitations imposed on education, work and transport. However, considering the rapid spread of the virus, additional restrictions on the movement of the population are being considered in an attempt to reduce the number of patients.

All the Italian Schools and Universities suspended teaching activity on 24th February, 2020. The rationale for this decision was to minimize the transmission of the virus between persons of different areas in the hope of reducing the spread of the infection.

Considering that SARS CoV-2 has been identified in the saliva of infected patients and that screening to determine the presence of the virus in Italy is carried out by sampling nasopharyngeal secretions, all Medical Doctors, Nurses and Dentists exposed to potential contact with this biological material are, at least in theory, exposed to an unknown risk of acquiring the SARS CoV-23 agent. Notably, the spread of the

disease is increasing in other European countries including France, Germany, Austria and the UK.

It is important to emphasize that prolonged close *face-to-face* contact between patients and operators during endodontic treatment creates a high risk for cross-infection. The contact between the mouth of the patients and the production of aerosols through the use of high-speed handpieces would appear to create a substantial risk for contamination and spread of the virus within dental clinics. Thus, routine endodontic therapies and emergency treatments are high risk for virus contamination. Furthermore, it is likely that University Dental Clinics and Dental Hospitals, where patients, students and teachers share the same spaces, may potentially create a reservoir and 'hub' for the spread of the virus. To confirm this potential within medicine, the virus has infected a large number of hospital healthcare doctors and nursing staff.

The prevention protocol being adopted in Italy includes:

1. Triaging patients to detect by the history any with respiratory infection, flu, acute respiratory illness, conjunctivitis and cardiovascular abnormalities;
2. Separation of patients with respiratory symptoms to limit their contact with dental staff, students and patients;
3. Avoiding dental treatment if at all possible;
4. Regular, meticulous and effective hand washing with no touching of face, eyes etc; use of face masks;
5. Decontamination of all surfaces within clinics with 0.1% sodium hypochlorite or 70% ethanol or 0.5% hydrogen peroxide, which are disinfectants already available in dental clinics (Kampf *et al.* 2020);
6. Respiratory hygiene/cough etiquette – use of tissues (Catch, Bin, Kill; https://www.england.nhs.uk/south/wp-content/uploads/sites/6/2017/09/catch-bin-kill.pdf);
7. Special precautions by dentists and assistants to prevent contamination from air droplets:
    a. Wear a disposable surgical mask and isolate the patient in a dedicated single-patient room (with closed door) separated from other staff/patients;
    b. When possible, use a rubber dam that must cover the nose of patient during the entire endodontic procedure;
    c. Application of powerful air/water surgical suction pump (aspirator) close to the tooth and a second suction close to the nose to prevent aerosol and saliva droplet diffusion;
    d. If possible, use high-speed handpiece with no exhaust;
    e. Decontamination of equipment, surgeries/operatories after reach patient.

General advice issued by many national authorities includes staying aware of the latest information on the COVID-19 outbreak. Take care of your health and protect others by doing the following:

- Regularly wash your hands with soap and water – for at least 20 s;
- Always wash your hands when you get home or into work;
- Use hand alcohol-based sanitizer gel if soap and water are not available;
- Cover your mouth and nose with a tissue or your sleeve (not your hands) when you cough or sneeze;
- Put used tissues in the bin straight away and wash your hands afterwards;
- Try to avoid close contact with people who are unwell;
- Do not touch your eyes, nose or mouth if your hands are not clean;
- If you have fever, cough and difficulty breathing, seek medical care early;
- Stay informed and follow advice given by your healthcare provider.

In conclusion:

1. The risk for dental personnel, dental nursing staff and for dental students is high and must be managed;
2. University students are a population with a substantial number of 'potential contacts' that must be limited;
3. Universities in high-risk areas should consider using online web-based teaching;
4. The development of a simple laboratory test to detect and monitor COVID-19 in Medical and Dental personal is necessary;
5. The role of the dentist in the prevention and monitoring of viral infections should be redefined.

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