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Letter to the editor

The role of telemedicine tools in managing the new chapter of SARS-CoV-2 pandemic

The severe acute respiratory syndrome coronavirus type 2 (SARS-CoV-2), which appeared in Wuhan Province, China, in December 2019, is still a major challenge to manage. Due to the specific structure of SARS-CoV-2 proteins, the virus has shown various mutations. Of these mutations, Eta, Iota, Kappa, and Lambda belong to the variant of interest (VOI), while Alpha, Beta, Gamma, Delta, and Omicron belong to the variant of concern (VOC).[1] The following pandemics have appeared in the last two decades, SARS in 2003, H1N1 flu (swine flu) in 2009, Ebola in 2014, and ZIKA in 2015 and currently COVID-19. In this regard, telemedicine has shown a high potential in providing a rapid platform between patient and clinician for pre-diagnosis, lower health service costs, and protection against public infection risks.[2,3] This brief letter evaluates the adoption of telemedicine as a novel tool to reduce the COVID-19 prevalence.

Telemedicine is defined as communication between patients and healthcare providers using electronic means.[2] Teledentistry is a specific type of telemedicine that helps perform preliminary dental care remotely. This safe and effective method can be applied to evaluate the suspected cases and minimize the risk of cross-infection, particularly in deprived areas that do not have access to oral specialists. Today, domiciliary dental care has increased dramatically during the strict COVID-19 lockdowns. However, some cases, such as acute pulpitis, require immediate treatment in a clinic after remote dental consultation. Accordingly, teledentistry cannot completely replace clinical therapy.[4,5]

Wu and McGoogan conducted a study in China on 72,314 participants, including 44,672 positive for COVID-19 (62%). They assessed the mortality rate on 44,672 patients who tested positive for COVID-19. According to mortality results of patients with comorbidities, 10.5% had cardiovascular disorders, 7.3% diabetes, 6.3% respiratory disease, 6% hypertension disorders, and 5.6% malignant diseases. Hence, the comorbidities increase the risk of developing COVID-19.[6]

The American Society of Clinical Oncology (ASCO) has stated prioritizing counseling, early diagnosis, and therapy; otherwise, the delay may adversely affect treatment. The preliminary data on teledentistry, showed that it could be used as an acceptable remote technology for patients with oral, head, and neck cancer. In addition, the prevalence of telemedicine has increased rapidly regarding the tendency of clinicians toward techniques to maintain ongoing care for their patients that lead to patient satisfaction. Overall, inabilities to control palpation, percussion, and auscultation, as well as the 2D shape of lesions, are the major limitations of telemedicine. Therefore, in some cases, a face-to-face examination is required to guide a final diagnosis.[5]

Currently, telemedicine is a novel tool for examining, diagnosing, and monitoring COVID-19 cases at home. As numbers of patients were infected with COVID-19 in hospitals and medical centers, remote medical consultation can reduce unnecessary referrals to health centers. After verifying the positive COVID-19 diagnosis, using telemedicine can prevent medical centers from becoming overcrowded with COVID-19 patients and allow patients to recover at home. In this respect, the remote and rapid diagnostic of COVID-19 (i.e., point of care (POR) diagnostic test) is helpful during this pandemic to contain the potential spread of the virus.[2,7]

In a review study, Nasiri and Dimitrova evaluated the efficacy of saliva and nasopharyngeal swab specimens through comprehensive quantitative analysis to detect COVID-19. The results revealed that both specimens have a similar detection rate. The results also highlight collecting saliva samples instead of other samples as an easy and safe method. Since inaccurate nasopharyngeal swab specimens can lead to increased false-negative results, the POR diagnostic device for saliva is the better choice for remote diagnosis of COVID-19.[8]

In telemedicine, wearable metabolic biosensors can be used to assess the etiology and effect of diseases. The serum of COVID-19 patients contains creatinine, urea, glucose, and ions (potassium, iron, sodium, calcium, bicarbonate, and chloride). Some of these metabolic

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biomarkers are directly related to the severity of COVID-19. For instance, the concentration of creatinine and urea is increased 5-fold in severe cases of COVID-19. The explanation for this increase is that the severe infection may affect kidney functions or patients with chronic kidney disease, who are at high risk of developing severe disease. Hence, wearable metabolic biosensors can provide an overview of the severity of COVID-19. In addition, skin-interfaced wireless devices can show the temperature, respiration rate, cough frequently, activity patterns, heart rate, pulse waveform, and SpO2. These devices can also assist in screening for symptoms of COVID-19.[7]

Medical applications such as Corona-Warn-App (CWA) can provide valuable suggestions on health-related information, particularly COVID-19 infection. For instance, the COVID-19 tracing app, i.e., CWA, is a smartphone app launched in June 2020 by the German government in cooperation with Robert Koch Institute. Based on Bluetooth, the CWA warns of a potential risk of infection through close contact with infected individuals who have tested positive and are registered in CWA. As a result, it can help interrupt the chain of COVID-19 infection. The analysis of CWA data showed satisfactory outcomes in reducing cross-infection.[9]

Given that SARS-CoV-2 has many mutations and its spike protein may mutate as a novel variant in the future, it is still a threat to global health.[1] Apart from social distancing, medical masks, hand disinfection, and vaccination, telemedicine can play a decisive role in curbing the spread of SARS-CoV-2. Hence, telemedicine should be implemented as a preventive measure to remote treatment. In addition, further clinical studies are required in the context of telemedicine to obtain more accurate and valid data in regard of remote treatment procedures.

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