Teledentistry during COVID-19 pandemic

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ABSTRACT

Background and aims: Dentistry involves close face-to-face interaction with patients, hence during the COVID-19 pandemic, it has mostly been suspended. Teledentistry can offer an innovative solution to resume dental practice during this pandemic. In this review, we provide a brief overview of applications of teledentistry.
Methods: Articles on teledentistry, relevant to this review, were searched and consulted from PubMed, Google Scholar, and Cochrane database.
Results: Teledentistry is the remote facilitating of dental treatment, guidance, and education via the use of information technology instead of direct face-to-face contact with patients. Teleconsultation, tele-diagnosis, teletriage, and telemonitoring are subunits of teledentistry that have important functions relevant to dental practice. There are many challenges for acceptance of teledentistry by the dentists as well as patients, which need to be addressed urgently.
Conclusion: Teledentistry can offer a novel solution to resume dental practice during the current pandemic, hence, the need of the hour is to incorporate teledentistry into routine dental practice. If not fully replace, at least teledentistry can complement the existing compromised dental system during the current pandemic.

1. Introduction

The COVID-19 pandemic has challenged the existing healthcare systems across the globe. As it spreads by droplet, fomite and contact transmission, face-to-face interaction of healthcare professional with the patient carries a risk of its transmission. As dental treatment invariably involves close inspection, examination, diagnostic and therapeutic interventions of the naso-oro-pharyngeal region, dental professionals are most susceptible to get infected with coronavirus [1]. As a result, during the current pandemic, most routine dental procedures all around the world, have been suspended, and only emergency dental procedures and surgeries are being performed.

However, looking at the current increasing trend of COVID-19 cases, it does not appear that this pandemic will end anytime soon. In fact, even the WHO has recently feared that this virus may become just another endemic virus in our communities and may never go away [2]. If these speculations are true and COVID-19 indeed becomes endemic, dental practice will need to reorganize and innovate to continue dental care with minimal risk of cross-

infection. Teledentistry can provide an innovative solution to continue dental practice during the current pandemic, as well as beyond.

2. Teledentistry and its utility during COVID-19 pandemic

Teledentistry (a subunit of telehealth along with telemedicine) is the remote facilitating of dental care, guidance, education or treatment via the use of information technology rather than through direct face-to-face contact with any patient [3]. Teledentistry is not a new concept and one of the earliest teledentistry projects was started by US military in 1994 to serve the US troops all around the world [4]. Over the years teledentistry has proved to be beneficial for remote dental screening, making diagnosis, providing consultation, and proposing treatment plan. It is found to be comparable to real-time consultations in areas with limited access to facilities, in school children, and in long-term healthcare facilities [5,6].

In today's circumstances of ongoing COVID-19 pandemic, with increasing likelihood of it becoming endemic, the main aim is to avoid person-to-person contact. The word 'tele' means 'distant', and therefore teledentistry satisfies the need for social distancing as has been advocated by the health authorities all across the globe

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to contain the spread of SARS-COV-2 virus. Teledentistry can be incorporated into routine dental practice as it offers a wide range of applications such as remote triaging of the suspected COVID-19 patients for dental treatment and decreasing the unnecessary exposure of healthy or uninfected patients by decreasing their visits to already burdened dental offices and hospitals.

3. Teledentistry subunits

3.1. Teleconsultation

The most common form of teledentistry is teleconsultation in which patients or local healthcare provider seeks consultation from dental specialists using telecommunication [7]. It has been valuable for the consultation of patients who are physically and intellectually challenged, and patients from aged care facilities and prisons [8—10]. Teleconsultation has been shown to reduce the number of referrals from primary health centers to higher centers by >45% [11]. In the current COVID-19 pandemic it may aid the patients in continuing their therapy during quarantine and lockdown.

3.2. Telediagnosis

Telediagnosis makes use of technology to exchange images and data to make a diagnosis of an oral lesion [12,13]. With the use of a telediagnosis program EstomatoNet, patient referral to specialists reduced from 96.9% to 35.1% [14]. While the use of smartphones for detection of dental caries is well advocated [15,16]; it has also served as a reliable adjunct for screening of oral potentially malignant lesions [17]. An addition to telediagnosis is telecytology, a system for early detection of oral potentially malignant or malignant lesions [18]. Haron et al. developed Mobile Mouth Screening Anywhere (MeMoSA®) to facilitate early detection of oral cancer and found it to be beneficial for patients with limited access to specialists [19]. Skandarajah et al. evaluated a tablet-based mobile microscope (CellScope device) as an adjunct for screening of oral cancer [20]. During the current COVID-19 pandemic investigators from Brazil recently illustrated the use of WhatsApp and telemedicine in making a differential diagnosis of oral lesions [21]. As most of the oral lesion are often directly evident telediagnosis can be made by dental photography thus reducing the need of close clinical examination [22].

3.3. Teletriage

Teletriage involves the safe, appropriate and timely disposition of patient symptoms via smartphone by specialists. It has been used for remote assessment of school children and prioritize those requiring dental care without unnecessary travel regardless of socio-economic and geographical difficulties in many places [23,24]. Brucoli et al. suggested use of teleradiology as a useful tool in triaging of maxillofacial trauma patients from peripheral centers to their main trauma center [25].

3.4. Telemonitoring

Monitoring of dental patients require frequent visits of patients to their dentist to monitor the progress of treatment. The use of telemonitoring can replace the frequent physical visits by virtual visits for regular monitoring of treatment outcomes and disease progression [7]. In a recent pilot study during this pandemic, telemonitoring appeared to be a promising tool in the remote monitoring of surgical and non-surgical dental patients, especially reducing costs and waiting times [26].

4. Challenges in teledentistry use and possible solutions

4.1. Challenges related to acceptance of teledentistry by dentists

The lack of acceptance of teledentistry by the dentists can be attributed to the fact that they may find it complex and maybe resistant to new skills [27,28]. They may be technologically challenged, be afraid of making an inaccurate diagnosis, and concerned about increased costs and expenses. There may be constraints related to infrastructure, such as, poor internet access, shortage of hardware, lack of training, lack of technical support and expertise. Organizational incompatibility of teledentistry with the healthcare system, insufficient financial reimbursement, inadequate guidelines, incoordination between remote and core center, and high cost of setup are other challenges related to its acceptance by dentists [28]. Two-dimensional representation of lesions and inability to perform tests like palpation and auscultation are other limitations [3].

To overcome these challenges, dentists must be trained adequately and educated about this technology, which will increase the acceptance of teledentistry. During the current pandemic, the dental school curriculum not only needs to be updated regarding infection control measures [29], teledentistry should also be routinely taught as a solution for prevention of infection transmission. In addition, adequate funding, payment and authenticating teledentistry within the healthcare systems will be required.

4.2. Challenges related to acceptance of teledentistry by patients

Patient acceptance is the key to success of any module. Lack of face-to-face communication may lead to apprehension of patients of inadequacy of proper communication of their problems to their dentists. These challenges will take time to overcome. Acceptability of teledentistry by the patients will increase in parallel with the acceptability of telemedicine in general, which is increasing day-by-day. Many surveys have found that teledentistry is gradually gaining acceptance by patients as well as healthcare providers [30,31].

5. Conclusion

Dentistry forms an important part of our healthcare system, which has become severely compromised during the current pandemic of COVID-19. The need of the hour is to incorporate teledentistry into routine dental practice. If not fully replace, at least teledentistry can complement the existing compromised dental system during the current pandemic.

Acknowledgement

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