The Impact of COVID-19 on Telemedicine in Ophthalmology: A Literature Review

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BACKGROUND AND OBJECTIVE

Telemedicine in ophthalmology (or teleophthalmology) has previously been described as being underwhelmingly utilized, playing a relatively minor role in clinical practice.(1) The COVID-19 pandemic, however, has created a situation where telemedicine has become a pivotal tool to avoid delaying of essential eye procedures which may cause significant and rapid vision impairment to irreversible blindness.(2) The objective of this review was to provide an overview of teleophthalmology and assess the potential impact of COVID-19 on its evolution

METHODS

A two-part pragmatic literature-review on teleophthalmology was performed in PubMed for (1) literature-reviews published between January 2010-to-June 2020 (2) studies reflecting the use of teleophthalmology associated with the COVID-19 pandemic. Guidelines developed by national authorities in response to COVID-19, were also assessed.

RESULTS

A total of 27 published articles were identified: (seven literature reviews and 20 publications related to COVID-19), six national guidelines were also assessed. Diabetic retinopathy, glaucoma, age-related macular degeneration and cataract have received the most attention in the telemedicine literature.(3) Concerning eHealth tools, one review identified 46 tools, which assessed near-and-distance vision – only one, however, was validated against gold-standard measures.(4) Concerning the publications related to COVID-19: generally, teleophthalmology reduces the number of unnecessary visits, while also efficiently regulates ophthalmic emergencies, and was found to be associated with a high level of patient satisfaction. (5)

However, and in the case of telehealth visits, it is important to recognize that some subspecialties are more suited than others. COVID-19 guidance from the Royal College of Ophthalmology (UK) and the American Academy of Ophthalmology recommend telemedicine can be used for triage, the consultation itself, management and counselling. (6, 7, 8, 9)

DISCUSSION

Virtual consultations

Dr. Carones webinars directed to inform patients and virtual consultations is already a routine in his daily work. https://carones.com/

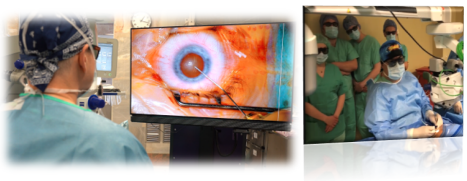
Ocular surgery is one of the most performed medical procedures in the world. Its limitation or suspension during the COVID-19 pandemic, could be associated with a significant increase in the number of blind people worldwide.(8) As this is the case, major attempts have been made to facilitate the treatment of patients by rapidly increasing the uptake of telemedicine in ophthalmology practice, with considerable and necessary efforts being made on facilitating virtual consultations. Documented elements of potential virtual examination include: visual acuity, colour vision, confrontational visual-field testing, ocular motility and eye alignment. (9)

Mobile e-health tools

Example of tools for out of the office examination

Given that two-thirds of the globe own mobile devices, mobile e-health tools also provide a likely solution to some of the challenges imposed by the COVID-19 pandemic,10 however, the literature reviewed for this research did not identify a clear uptake or guidance regarding these mobile tools during this period. A previous review on the topic may have intimated as to why – concluding that there was a clear lack of validation and indeed regulation concerning the available technologies. (4) However, the rapid advance of 5G, “internet of things” and artificial intelligence will likely have a significant bearing on the development and future uptake of these technologies. (11)

3D heads visualization systems in ophthalmic surgery



A further technology in the ophthalmic surgery that was identified as part of the review was that of 3D heads-up visualization systems. One of the benefits of this technology is the potential to harness its virtual capabilities for telemedicine surgery, allowing for trainer-trainee viewing exchange, multiple potential participants and the possibility of remote mentoring. (12)

CONCLUSIONS

COVID-19 has served to act as a catalyst for virtual consultations/telemedicine to be recommended for preoperative and postoperative visits.(13,14) Indeed, this necessity will likely have enduring effects, embedding the use of telemedicine ophthalmic care. Furthermore, innovations in telemedicine, such as deep-learning prediction technologies and tele-robotics for surgery are advancing, promising improved efficiency and may have the potential to transform ophthalmic practice.(11)

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