Commentary: Teleophthalmology and electronic medical records: Weighing the pros and cons of unavoidable progress

Vision is undeniably the most important of the special senses; thus, eye care is a universal need. Due to various reasons, there are several people who need critical eye care but are unable to access the same. There are several regions with no eye care facilities or ophthalmologists or even any medical personnel. Increasing the number of doctors and other medical personnel may alleviate this problem to some extent, but the inequitable distribution of doctors can never be fully solved.

As mentioned in the accompanying article,[1] majority of the population that needs eye care in middle- and low-income countries live in rural areas, which are not preferred by doctors for their practice. A variety of strategies have been tried, including the development of rural health infrastructure, rural recruitment, professional-replacement, increased supply, compulsory rural service, and financial strategies with varying rates of success.[2] Teleophthalmology can help solve inequitable distribution by allowing the doctors to live and do their routine work in the place they are comfortable in, while still delivering health care in areas of need.

Teleophthalmology can prevent unnecessary delays in diagnosis and treatment, which often happens because of various reasons, even in places with access to good health care.

These delays can lead to severe disease and complications that cannot be completely treated, such as untreated corneal ulcers and lens-induced glaucoma. Teleophthalmology can "triage" patients at the peripheral level and refer patients needing urgent treatment. It can potentially improve health-seeking behavior of the population by bringing their doctor to them. Mid-level ophthalmic personnel (MLOP) can be easily trained to operate the peripheral centers and can connect to potentially any doctor who is available at that particular time. Doctors can even work from their home, perhaps opening up the opportunity to ophthalmologists on medical or maternity leave.

Although it has several advantages, teleophthalmology can lead to a deterioration of the doctor–patient relationship and several clinical findings may be missed. Patients may be reluctant to give a good and complete history when interviewed over a computer, leaving out crucial information. The clinical examination would never be satisfactory as the ophthalmologist may not be sure of the presence or absence of many subtle findings. Nevertheless, it definitely has a place in the modern world of technology, and perhaps, the advances in technology can reduce the shortcomings.

A good teleophthalmology setup requires a good electronic medical records (EMR) system. The authors of the accompanying article used "eyeSmart EMR," which was an innovative application running on Android tablet computers.[3] This application allows one to capture demographic patient data, clinical details, and tablet-based slit-lamp photographs, and then video conference over a 3G mobile network—a truly compact, inexpensive, and portable teleophthalmology system. The eyeSmart EMR attaches to the slit lamp eyepiece using a 3D printed "Cyclops" adapter[4] that allows easy capture of clinical photographs. Excellent fundus photos can be captured by smartphone fundus photography using simple homemade adapters.[5,6] This guide shows how to capture excellent slit lamp, 90D, gonioscopy, and even specular photographs using smartphone cameras.[7] EMR data can be easily used for statistical analysis as described by the authors in the accompanying article.[1] Data storage does not take up much physical space as several gigabytes of data can be stored on a tiny memory card. Loss of data can be prevented by having a backup in the cloud for redundancy. Even realtime statistics and data analysis can be performed on live data. Artificial intelligence and machine learning (ML) can be used to predict diagnosis, prognosis, and disease patterns with minimal input.[8]

Despite all the advantages of an EMR, it slows down the patient flow and leads to poor face-to-face interaction of doctor and patient, as a lot of time is spent in filling the data into the EMR. Hopefully, with the evolution of better software and digital interfaces, technology would not come in the way of doctor–patient interaction and would truly enhance the clinical acumen of the doctor and help in advancing medical science.

John Davis Akkara[1,2], Anju Kuriakose[3]

[1]Department of Ophthalmology,
Little Flower Hospital and Research Centre, Angamaly,
[2]Glaucoma Department, Westend Eye Hospital, Cochin,
[3]Department of Ophthalmology, Jubilee Mission Medical College,
Thrissur, Kerala, India

Correspondence to: Dr. John Davis Akkara,
Glaucoma Department, Westend Eye Hospital, Kacheripady,
Cochin - 682 018, Kerala, India.
E-mail: JohnDavisAkkara@gmail.com

References

1. Misra N, Khanna RC, Mettla AL, Marmamula S, Rathi VM, Das AV. Role of teleophthalmology to manage anterior segment conditions in vision centres of south India: EyeSmart study-I. Indian J Ophthalmol 2020;68:362-7.
2. Wibulpolprasert S, Pengpaibon P. Integrated strategies to tackle the inequitable distribution of doctors in Thailand: Four decades of experience. Hum Resour Health 2003;1:12.
3. Akkara J, Kuriakose A. Innovative smartphone apps for ophthalmologists. Kerala J Ophthalmol 2018;30:138-44.
4. Akkara J, Kuriakose A. The magic of three-dimensional printing in ophthalmology. Kerala J Ophthalmol 2018;30:209-15.
5. Raju B, Raju NSD, Akkara JD, Pathengay A. Do it yourself smartphone fundus camera-DIYretCAM. Indian J Ophthalmol 2016;64:663-7.
6. Chandrakanth P, Ravichandran R, Nischal N, Subhashini M. Trash to treasure Retcam. Indian J Ophthalmol 2019;67:541-4.
7. Akkara J, Kuriakose A. How-to guide for smartphone slit-lamp imaging. Kerala J Ophthalmol 2019;31:64-71.
8. Akkara JD, Kuriakose A. Role of artificial intelligence and machine learning in ophthalmology. Kerala J Ophthalmol 2019;31:150-60.