

# Personal Experience With COVID-19 and Community Screening of Diabetic Retinopathy in Iran

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Sepideh Jamali, MD<sup>1</sup>, Elham Ashrafi, PhD<sup>2</sup> ,  
and Seyed Farzad Mohammadi, MD, MPH, FICO<sup>2</sup>

## Keywords

COVID-19, community screening, diabetic retinopathy, Iran

Diabetes mellitus and its complications threaten global health. The prevalence of diabetes is predicted to rise more than 1.5 times from 2000 to 2030,<sup>1</sup> so the complications of diabetes such as diabetic retinopathy (DR) will grow, likewise. DR as a leading and a potentially preventable cause of visual impairment and blindness is becoming a priority in eye conditions.<sup>2,3</sup> On the other hand, it has been proven that timely and regular screening and treatment can reduce the consequent complications by up to 90%.<sup>4</sup>

As we found about two-thirds of patients with diabetes in remote areas have not ever received routine eye examination, we have established a community screening program for DR, based on a portable retinal camera (Horus DEC 200; MiiS, Hsinchu, Taiwan) to screen for sight-threatening/referable DR remotely. For this system, we normally need basic health care facilities in the remote areas and minimal technical training for community health workers, who were trained to work with the cameras and transfer the data to through a web or custom cell phone-based application, which is connected to the internet.

We have learned that we need more intelligence to be informed and prepared to deal with difficult situations like COVID-19. This pandemic has changed our screening approach of DR. Our greatest challenges included patients' cooperation, transferring data accurately, and informing patients about their routine follow-up. So COVID-19 surprised us and we had to hold our activity due to protocols in order to protect our patients.

The COVID-19 pandemic has affected the entire world and Iran's health systems. In our DR community screening case, our technicians need to work with portable cameras at a very close and unsafe distance with the patients, something that is against the "social distancing" strategy and implies a high risk to transmit the infection. On the other hand, patients with diabetes are often older than 50 years and have other systemic comorbidities such as chronic heart disease and

poor immune status because of diabetes mellitus and are at a higher risk for COVID-19.<sup>5</sup>

Current recommendations regarding Corona prevention and treatment are the top health priority, and naturally screening programs (nonurgent and nonemergent) should be halted. But if we want to effectively prevent DR visual loss, then screening is mandatory for early diagnosis. But the COVID-19 epidemic made us stop enrolling new patients in our centers, now for more than three months, and we have had no routine follow-ups as well. So considering eye care service has been delayed for patients with diabetes during the current pandemic, we can predict an incidence of sight-threatening events in the not too distant future. It is noteworthy that we are in 2020 and this problem is contrary to the Vision 2020<sup>6</sup> global initiative mission.

Even prior to the COVID-19 situation, we occasionally felt that strategies like development of infrastructure or using appropriate technology like portable cameras in the office may not be optimal for timely screening, that is, it is sometimes extra and for some others late. Exceptional access lies in a kind of self-screening beside virtual contact which regards the social distancing strategy. Now we have learned that development in human resources and current technologies won't guarantee availability and accessibility of eye care service in all situations. If patients have access to accurate portable cell phone-based cameras, then that would be easy for everyone to use. We are obtaining considerable data and applying machine learning algorithms to automate the decision-making process. This method can lead to great

<sup>1</sup>Department of Ophthalmology, Mayo Clinic, Rochester, MN, USA

<sup>2</sup>Translational Ophthalmology Research Center, Farabi Eye Hospital, Tehran University of Medical Sciences, Iran

## Corresponding Author:

Elham Ashrafi, PhD, Translational Ophthalmology Research Center, Farabi Eye Hospital, Qazvin Square, Tehran 1336616351, Iran.  
Email: eashrafi@sina.tums.ac.ir

progress in public health with greater accuracy and safer ways to screen for DR, at least in the infectious epidemic like COVID-19 that therefore needs less human contact to screen and diagnose.

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#### ORCID iD

Elham Ashrafi  <https://orcid.org/0000-0001-8640-0168>

#### References

1. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. *Diabetes Care*. 2004;27(10):1047-1053.
2. Cheung N, Mitchell P, Wong TY. Diabetic retinopathy. *Lancet*. 2010;376(9735):124-136.
3. International Diabetes Federation. *IDF Diabetes Atlas*. 6th ed. Brussels, Belgium: International Diabetes Federation; 2015.
4. Klein R. The epidemiology of diabetic retinopathy: findings from the Wisconsin epidemiologic study of diabetic retinopathy. *Int Ophthalmol Clin*. 1987;27(1):230-238.
5. Guo Y, Cao Q, Hong Z, et al. The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak – an update on the status. *Military Med Res*. 2020;7(1):11.
6. The International Agency for the Prevention of Blindness. VISION 2020: the right to sight. <http://www.iapb.org/vision-2020>. Accessed April 2020.