

Diabetic Retinopathy Epidemy: How to Combat it?

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Diabetes is an enormous world health problem, taken into account the ageing population. At present in the world there are more than 400 million persons (422 million in 2014 [1]) suffering from diabetes, and in 2040 the number of patients will reach 642 million, about 10% of the adult population aged 20 - 79 [2]. Expectably, during coming 20 years 135 million of current diabetes patients will develop diabetic retinopathy (DR), which looks like an epidemy.

In the past, the management of DR, as a microvascular complication of diabetes, took a middle seat in the diabetes landscape, but now, it has become an integral aspect in overall patient care, ultimately redefining diagnostic and treatment methods, and perspectives.

But can the strategy work for the management of DR ? Scientists are starting to think it might. A global effort to solve this not only medical, but at the same time the social problem must be based on the systematic eye screening and preventive treatment. Early detection gives physicians a chance to minimize damage.

Over the past decade, efforts have made to increase access to health care, despite these actions continued reliance on traditional delivery systems will clearly mean continued lack of access for diabetic patients, specifically those with DR.

The team of international researchers conducted survey of 4,340 patients and 2,329 health care providers, summarizing the findings in the Diabetic Retinopathy Barometer Report, produced by the International Federation on Ageing (IFA), International Diabetes Federation (IDF), International Agency for the Prevention of Blindness (IAPB), and Bayer Pharma [2,3]. Unfortunately, as was highlighted by the researchers, there are substantial multiple obstacles, starting from financial, regulatory up to medical, to implementing worldwide management of DR. The raised issues are related to the patients, primary health care workers, and ophthalmologists.

Patient-related concerns: low or an absent awareness on eye complications of diabetes due to limited education by primary health care workers (general practitioner and nurse), underestimation of significance of systematic eye examinations directed to catch the early findings of Diabetic Retinopathy to increase an outcome of therapeutic intervention.

Primary health care workers-related concerns: lack of medical information on the issue for the patients. Over half of providers did not have information on diabetes and potential eye complications or had inadequate information to offer their patients.

Ophthalmologists-related concerns: long wait-times for appointments, the costs of appointments, lacked guidelines on referrals and screening, the lack of enough specialized eye centers to deliver required interventions. A major challenge for the ophthalmologists and the greatest barrier to improve outcomes is a late diagnosis, in part due to infeasibility to treat far advanced condition at initial presentation.

General consensus based on currently available findings is that at present DR management is inadequate due to aforementioned subjective and objective factors.

So how can we improve delivering care to the patients with DR from one hand and prevent vision loss in patients with diabetes from the other hand? How we can cost-effectively treat the raised concerns?

The first step in the DR management algorithm is a systematic diabetic eye screening, which should be easily accessible for a patient and affordable, and at the same time non-causative for economical burden. These goals are achievable using technological developments in retinal imaging; automatic analysis of retinal photographs by Software and telehealth approach for remote management of cases.

Patients with diabetes typically visit their primary care provider 3 or 4 times per year; therefore the opportunity to capture patients for eye screening is much greater in the primary care setting, and this is where most of the screening will be done.

Workflow and screening will be concentrated at the Family Doctors office, where nonphysician could take a photo of the patient's back of the eye, specifically the retina, by Portable Eye and Retinal Imaging System - Fundus Smartphone Adapter easily attached to an Apple or Samsung smartphone [4], or portable ophthalmic diagnostic equipment as a pocket-sized, solar-powered ophthalmoscope [5], creating an ophthalmic camera for vision care screening and evaluation. A photo taken by technical worker will be sent on-line to an ophthalmologist, who is able to conclude on status of retinal microvasculature, sending his conclusion back to the general practitioner or endocrinologist, who may necessitate precautions in diabetes patients. Thus, modern non-invasive, time-saving, cost-effective retinal exam could be incorporated in the diagnostic protocols of diabetic patients.

The second step in the Diabetic Retinopathy management algorithm- obtained retinal image will be analyzed by approved software, successfully tested in the clinical setting [6-9].

A recent study assessing a primary-care-based teleretinal Diabetic Retinopathy screening [9] indicated that implemented program have reduced wait times for DR screening from 158 days to 17 days and increase overall screening rates from 40.6% to 56.9%. Researchers have demonstrated the potential of the program to maximize access and efficiency of care, "resulting in the elimination of the need for more than 14,000 visits to specialty care professionals, a 16.3% increase in annual rates of screening for DR, and an 89.2% reduction in wait times for screening." These encouraging results suggest viability of this approach.

The third step in the Diabetic Retinopathy management algorithm- Retinal photos of selected patients will be sent on-line to consulting ophthalmologist, who will in the next step, finally judge each case and create an individualized follow-up and treatment protocol. Proposed approach will allow an affordability, improved eligibility for timely intervention in diabetes patients and heighten an efficacy of human resources (general practitioner and other primary health care providers, endocrinologists, ophthalmologists) exploitation finalized by high visual outcomes in patients and decrease of visually disabled handicaps, with high economic impact.

We believe that the ophthalmologists should partner with: Family Doctors (FMD), endocrinologists; use telehealth services to coordinate care and deliver current evidence-based specific interventions in terms to achieve a manageable level for diabetic retinopathy.

Summarizing, the following steps should be undertaken to underscore the main avenues of intervention:

1. The patients education - raising awareness in patients of the risks of lack of eye examination and failure to follow up, by Educational patient-oriented Handouts on Diabetes -related eye diseases and teaching meetings for patients suffering from diabetes conducted by primary care providers, endocrinologists, ophthalmologists.
2. Tight interprovider communications between FMD, endocrinologists, ophthalmologists to control modifiable risk factors for DR: gradual, in contrast to sudden, blood sugar control, blood pressure control (140/80 mm Hg), likewise participation in the patient education and systematic eye screening.
3. Comprehensive management of DR by specialized ophthalmologist at secondary and tertiary levels of eye care with incorporation of new cutting-edge advances in pharmacotherapeutic, laser and surgical interventions.

In summary, modern non-invasive, time-saving, cost-effective retinal exam could be incorporated in the diagnostic protocols of patients with diabetes. Having an awareness of current best practices and tight interprovider communication starting from Family Doc-

tors and including ophthalmologists, endocrinologists and communication with the patients is vital to optimizing outcomes of diabetic patients suffering from diabetic retinopathy. Aforementioned underscored the key role of FMD not only in battling against diabetes, but likewise dominantly in preventing vision loss from DR and maintaining good quality of life with sight saved.

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Bibliography

1. "Global report on diabetes". World Health Organization, Geneva (2016).
2. The Diabetic Retinopathy Barometer Report Global Findings. Global Report.
3. Cavan D., *et al.* "Diabetic Retinopathy Barometer Study: Global perspectives on access to and experiences of diabetic retinopathy screening and treatment". *Diabetes Research and Clinical Practice* 129 (2017): 16-24.
4. <https://www.d-eyecare.com>
5. Blaikie A., *et al.* "Arclight: a pocket ophthalmoscope for the 21st century". *British Medical Journal* 355 (2016): i6637.
6. Valverde C., *et al.* "Automated detection of diabetic retinopathy in retinal images". *Indian Journal of Ophthalmology* 64.1 (2016): 26-32.
7. Hansen MB., *et al.* "Automated detection of Diabetic Retinopathy in Three European Populations". *Clinical and Experimental Ophthalmology* 7.4 (2016): 1000582.
8. Levenkova A., *et al.* "Automatic detection of diabetic retinopathy features in Ultra-Wide Field retinal images". InSPIE Medical Imaging. International Society for Optics and Photonics (2017): 101341M-101341M.
9. Daskivich LP., *et al.* "Implementation and Evaluation of a Large-Scale Teleretinal Diabetic Retinopathy Screening Program in the Los Angeles County Department of Health Services". *JAMA Internal Medicine* 177.5 (2017): 642-649.

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