

A short note on how diabetic retinopathy leads to preventable blindness

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Description

Diabetic Retinopathy (DR) is the most common vascular disease of the retina. It was the fifth leading cause of preventable blindness and the fifth leading cause of moderate-to-severe visual impairment in people over the age of 50 worldwide. DR is highly associated with future risk of cerebrovascular disease, myocardial infarction, and congestive heart failure. Extra-ocular factors associated with the risk of DR and its progression is poor glycemic control, hypertension, dyslipidemia, duration of diabetes, pregnancy, and genetic factors. DR is divided into non-proliferative and proliferative phases. Non-proliferative DR involves progressive intra-retinal micro-vascular changes. PDR is characterized by the growth of newly formed blood vessels on the retina or optic disc. Diabetic Macular Edema (DMO) refers to retinal thickening at the posterior pole and can occur in both NPDR and PDR.

DR ranges from mild abnormalities characterized by vascular hyper-permeability through moderate and severe NPDR characterized by progressive retinal capillary leakage or loss leading to retinal ischemia to PDR characterized by the development of new blood vessels on the optic nerve head and retina. The growth of these new blood vessels is often accompanied by the formation of fibrous tissue, and subsequent contraction results in vitreous hemorrhage and Tractional Retinal Detachment (TRD). PDR, whether untreated or treated, always reaches a regressive dormant phase. Subsequent levels of Visual Acuity (VA) depend on the extent of damage to vital structures that has occurred up to that point. Laser panretinal photocoagulation with PDR induces this resting state early. Patients with NPDR are usually asymptomatic. When PDR develops, patients may experience sudden loss of vision due to

vitreous haemorrhage as DMO progresses; patients may notice more gradual vision loss.

A comprehensive ophthalmologic examination in patients with DR includes measurement of VA and intraocular pressure, evaluation of the anterior segment by slit-lamp bio-microscopy, and gonioscopy if indicated elevated intraocular pressure, glaucoma, or iris vessels for new-borns and dilated fundus examination. A fundus examination can be performed by a layman using a handheld viewing scope. The clinical diagnosis and characterization of DR is primarily based on typical abnormal findings on fundus examination. The main manifestations of NPDR are micro-aneurysms sacform projections in the retinal capillary walls due to loss of pericytes intra-retinal dot blot hemorrhages, and effusions. Treatment principles can be broadly divided into prevention, early detection, and ophthalmic treatment to reduce the risk of blindness in the eye with sight-threatening complications.

Treatment of dyslipidemia may be beneficial in DR. These results are consistent with those of the fenofibrate intervention and event lowering in diabetes study. This was a randomized study of fenofibrate mono-therapy and showed that the need for laser treatment for PDR was significantly reduced in the fenofibrate therapy group compared to the placebo group. Vision-threatening retinopathies may not cause symptoms that warrant investigation until the disease is advanced. Treatment to reduce the risk of ocular vision loss associated with vision-threatening DR complications is most effective when initiated before severe vision loss occurs. Artificial intelligence systems can improve DR screening by reducing reliance on manual work, saving resources and costs, and can be incorporated into current or routine future screening programs increase.

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Conflict of Interest

The author has nothing to disclose and also state no conflict of interest in the submission of this manuscript.

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