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Editorial

Diabetic retinopathy: The rising tide

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1. Introduction

Diabetic retinopathy is a common microvascular complication of diabetes mellitus. It is an important cause of visual impairment and blindness among working-age adults globally. With the exponentially increasing prevalence of diabetes in countries like India, diabetic retinopathy has emerged as a challenging public health concern. Prevention, early detection and therapeutic interventions are the need of the hour to control this growing epidemic.

Diabetic retinopathy is caused by prolonged hyperglycemia, which damages the retinal microvasculature, leading to capillary leakage, ischemia, and neovascularization.[1] Non-Proliferative Diabetic Retinopathy (NPDR) is typically characterized by microaneurysms, retinal hemorrhages, and may be associated with macular edema which causes visual impairment. The hallmark of Proliferative Diabetic Retinopathy (PDR) is retinal neovascularization, which can cause vitreous hemorrhage. The advanced diabetic eye diseases (ADED) include persistent vitreous hemorrhage, tractional retinal detachment and neovascular glaucoma, all of which lead to severe vision loss.[2]

2. The Growing Burden of Diabetic Retinopathy

The International Diabetes Federation (IDF) estimates that globally over 537 million people have diabetes, and this is expected to rise to 643 million by 2030.[3] Diabetic retinopathy affects approximately 34.6% of individuals with diabetes.[4] The growing prevalence of diabetes, particularly in developing countries, correlates with an increased burden of diabetic retinopathy.

As life expectancy increases, so does the potential prevalence of diabetic retinopathy, meaning more people with diabetes will be living long enough to develop this serious eye complication, potentially leading to a significant rise in cases of vision loss related to diabetes due to the extended duration of the disease with age; this is further compounded by the growing global diabetes epidemic.[5]

3. Indian Scenario

India is often referred to as the "diabetes capital of the world," as it is estimated that it has over 101 million diabetics. Studies estimate that the prevalence of diabetic retinopathy among Indian diabetics ranges from 12% to 22%, with higher rates observed in urban populations due to lifestyle factors, while rural areas have lower awareness and limited access to eye care services so often present with more advanced disease.[6,7] A nationwide study reported that the prevalence of diabetic retinopathy was as high as 16.9% among those aged 50 years and above.

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Risk Factors Contributing to the RiseSeveral risk factors contribute to the increasing prevalence of diabetic retinopathy. Poor glycemic control leads to persistent hyperglycemia which accelerates retinal microvascular damage.[8] Systemic comorbidities like systemic hypertension and dyslipidemia exacerbate retinal vascular damage.[9] The risk of diabetic retinopathy increases with the duration of diabetes, an important non modifiable risk factor, with nearly all patients showing some degree of retinopathy after 20 years.[10] Smoking and sedentary lifestyle also contribute to endothelial dysfunction and diabetic retinopathy progression.[11] Many patients remain undiagnosed until advanced stages due to low levels of awareness and inadequate screening programs, especially in rural areas. All Ophthalmologists noted the impact of COVID 19 on diabetic retinopathy, patients missed their follow up as many routine OPDs were closed or due to fear of contracting the disease in the hospital. Many missed their doses of intravitreal Anti VEGF, an important treatment modality to vision threatening retinopathy. We noted that many of our diabetic patients worsened dramatically during the pandemic.

4. Impact of Diabetic Retinopathy

Diabetic retinopathy significantly affects the quality of life by impairing vision, limiting routine activities such as reading, driving and often affects the persons work life. It has been shown to increase the risk of falls, depression, and social isolation.[12]

The economic burden of diabetic retinopathy is extremely high, including direct medical costs, loss of productivity, and increased dependency on caregivers. The global cost of vision loss due to diabetic retinopathy is estimated to exceed $20 billion annually.[13]

5. Prevention and Management Strategies

5.1. Early detection and regular screening

Regular screening and early detection right from the time of diagnosis of Type 2 DM are crucial to preventing visual loss. The American Diabetes Association recommends an annual dilated fundus examination for all diabetic patients. Patients may require fundus photography and Optical Coherence Tomography (OCT) to obtain cross-sectional images of the retina to detect macular edema and other biomarkers of diabetic retinopathy. Fluorescein angiography may also be done to identify areas of ischemia and neovascularization. In our experience, as also in most developing countries, many diabetic patients go to an optical shop and change their spectacles. They are not seen by an Ophthalmologist and do not undergo a dilated fundus examination. Thus they are not routinely screened for diabetic retinopathy.

5.2. Glycemic and risk factor control

Strict glycemic control reduces the risk of diabetic retinopathy progression by up to 76%.[14] Controlling hypertension and dyslipidemia also decrease the risk of diabetic retinopathy.[15] Lifestyle modifications, including a balanced diet, regular exercise, and cessation of smoking will help reduce the burden of diabetic retinopathy. Treatment options include Laser Photocoagulation which has stood the test of time and prevents visual loss by sealing leaking blood vessels and reducing retinal neovascularization.[16] Intravitreal Injections of Anti-VEGF agents, such as ranibizumab and aflibercept are effective in reducing macular edema and preventing neovascularization.[17] Surgical procedures including Pars Plana Vitrectomy are the standard of care in advanced cases with vitreous hemorrhage or retinal detachment.

5.3. Public health initiatives

The Indian government has integrated diabetic retinopathy screening into the National Programme for Control of Blindness (NPCB) and this has benefitted numerous diabetic patients. Exclusive eye camps for the detection and treatment of diabetic retinopathy are the future of screening and treatment for this potentially blinding disease. Active survey in detection of diabetic retinopathy in the field is an effective method to detect it early. Use of portable lasers have enabled laser treatment at the doorstep. A pilot study in a provincial area of Myanmar has demonstrated the feasibility of identifying patients with vision threatening diabetic retinopathy and treating them with portable lasers.[18]

Artificial Intelligence -based screening tools have proved useful in the early detection of diabetic retinopathy in resource-limited settings.[19]

Teleophthalmology programs improve awareness and access to diabetic retinopathy screening, especially in rural areas.[20]

6. Conclusion

Diabetic retinopathy represents a rising tide in global eye health, with India facing a particularly steep increase due to the growing diabetes epidemic. Routine screening is the single most useful strategy to prevent blinding complications as diabetic retinopathy is asymptomatic in its eminently treatable stages. Early detection, strict glycemic control, and timely interventions are essential to prevent visual loss and to reduce the burden of diabetic retinopathy on society. A multidisciplinary approach involving healthcare providers, policymakers, and public health initiatives is the only plausible solution to curb this escalating crisis.

7. Conflict of Interest

None.

8. Acknowledgement

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