Diabetic Retinopathy: My Brief Synopsis

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Diabetes mellitus (DM) is a global epidemic. More than 80% of diabetes death occurs in under developed - and developing -countries. World Health Organization (WHO) projects that diabetes will be the 7th leading cause of mortality in 2030. It is estimated that 439 million people are likely to have DM by year 2030 worldwide and that this increase is disproportionately more in developing countries (69% in developing countries v/s. 20% in developed countries with 2010 as baseline)[1]. Current statistics suggest that an estimated 50% of diabetic cases remain undiagnosed.[2,3,4] This will result in heavy burden on health care system because of several DM related complications.

Diabetic retinopathy (DR), the leading cause of visual disability in diabetics, is an important complication of DM. Patients with diabetic retinopathy (DR) are 25 times more likely to become blind than non-diabetics. The reported prevalence of DR in India ranges from 17.6% to 28.2%. Study from South India ,reported prevalence rates of DR in NIDDM patients were 34.15 % and 37%.[5,6] With this prevalence, the number of people with DM is expected to increase to 79.4 million and patients with DR would increase to 22.4 million in another two decades[7]. The potential economic and social burden of DM and DR demands a definite need for an effective screening strategy, accurate case detection and management, effective for both DM and DR. Globally, there is an increase in vision-threatening retinopathy. In India, there is a paucity of data on the prevalence of DR in type 1 diabetes mellitus, as a registry for prevalence of type 1 diabetes is only recently being set up in the country. An earlier study done in a clinic-based population reported an overall prevalence of type I DR as 14%. NPDR was observed in 6%, while 4% had macular oedema and 4% had PDR. Asian Young Diabetes Research (ASDIAB) Study[8], reported the prevalence of DR in 724 young diabetic subjects of age 12-40 yr with duration of diabetes < 12 months in 7 centres of four Asian countries. It is interesting to note that DR prevalence was least among Indians (5.3%) as compared to other ethnic groups like Malasiya(10%) and Chinese (15.1%)[9].

DR is a progressive disease predominantly affecting the microscopic vessels of the retina. Progression occurs from mild to moderate characterized by few micro aneurisms, cotton wool spots/vascular permeability, to moderate and to severe NPDR characterized by vascular closure and an increased risk for the development of PDR distinguished by the growth of new blood vessels on the retina and posterior surface of the vitreous. Visual impairment in diabetic retinopathy occurs due to retinal hemorrhage, diabetic macular edema (DME) and PDR. DME is defined as retinal thickening/hard exudates within 500 µm of the centre of the macula which is due to increased permeability of retinal vessels leading to macular oedema and retinal thickening. The other cause of visual impairment in DR is PDR where there may be a sudden vitreous haemorrhage from the unstable new vessels resulting in total or partial visual loss or from pre-retinal haemorrhage/fibrosis or traction at the macula[8].

Screening for diabetic retinopathy should be mandatory for all diabetics as diabetes mellitus is assuming alarming epidemic proportions in the developing countries due to an increasingly inappropriate diet high in fat and carbohydrates, sedentary life style, and obesityt[8]. This should consist of dilated fundus examination of the diabetics at least once a year. This could best be achieved by a National Diabetic Retinopathy Screening Programme[10]. Basic requirements for such a screening programme include identification of the population at risk, an efficient recall system so that patients are not lost to follow-up, an effective instrument for retinal viewing (an ophthalmoscope or a non-mydriatic fundus camera), an experienced interpreter of the findings, a screening protocol defining clinical parameters for referral and treatment, a system for effective management of the identified cases and their feedback, and finally, quality control.

As individuals with sight-threatening retinopathy (PDR and DME) may not have symptoms, life-long evaluation for retinopathy by retinal screening of diabetic individuals is a valuable and necessary strategy. Screening strategies

depend on the rate of appearance and progression of diabetic retinopathy and on the risk factors that alter these rates. The retina may be examined by ophthalmoscopy and slit lamp bio microscopy using 78 D lens, or by using retinal photography. It has been shown that seven-standard field stereoscopic 30° fundus photography is the gold standard for assessing DR, however digital colour photography hase now replaced this cumbersome mode of screening[11]. Recently several new, noninvasive techniques promise to improve diagnostic sensitivity, one such technique is the optical coherence tomography (OCT). This method co-relates well with fundus fluorescein angiography (FFA)[12].

Laser photocoagulation and vitrectomy have improved the quality of life for patients with DR and prevented debilitating visual loss. In a study conducted in 261 eyes of 160 type 2 diabetic subjects with PDR who underwent pan retinal photocoagulation (PRP), 73 per cent eyes maintained >6/9 at 1 yr follow up[13]. However, laser photocoagulation and vitrectomy are indicated only when DR has progressed to a measurably advanced stage in which some visual loss has already occurred[14]. Because of these limitations of current management strategies, new pharmacological therapies are being developed; targeting the fundamental pathogenic mechanisms that initiate or sustain the progression of DR. Intravitreal Anti VEGF agents which includes Ranibizumab and Bevacizumab has shown promising results in DME[15]. Currently recalcitrant DME has been treated with moderate success by intravitreal injections of steroids[16,17]. Various antiproliferative agents which have been tried in anti-cancer therapy are being tried in PDR. Handling of the increasing problem of diabetes mellitus and its danger to sight should also include effective education and communication with the patients on the one hand, and with general ophthalmologists, primary care physicians, diabetologists, and allied health professionals on the other hand.

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