
Referral for Diabetic Ophthalmopathy: Why and When ?

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Abstract:

Many systemic diseases are associated with ocular manifestations. Diabetic Retinopathy is the leading cause of new blindness in adults. Considerable progress has been made for the detection and treatment of diabetic eye disease, helping to lift the threat of blindness from people with diabetes.

Ophthalmological examination is extremely important since timely treatment reduces serious vision loss by up to 95%. Thus medical practitioners must be well aware of the clinical features of diabetic ophthalmopathy and the best time to refer these patients to Ophthalmologists.

Key words: Diabetic Retinopathy, Management, Blindness Prevention.

Diabetic eye disease includes Diabetic Retinopathy and its rare and advanced complications of rubeosis iridis and secondary glaucoma, Cataract and Extra-ocular muscle palsies due to vascular events in the brainstem or cranial nerves. Diabetic Retinopathy (DR) is a major threat to sight. Central visual loss of variable severity may result from involvement of the macula while proliferative retinopathy and advanced diabetic eye disease can cause total blindness.¹ In the developed, at least 12% of all blindness is due to diabetes and DR is the most common cause of legal blindness in individuals between the ages of 20 to 65 years.² Senile cataracts too appear earlier and progress more rapidly in diabetic subjects than in the general population.

Many population based surveys have reported the prevalence and/or incidence of DR. The prevalence of retinopathy (of any degree) is positively associated with the duration of diabetes; it is highest in young onset insulin treated patients and lowest in older onset diabetics who are not taking insulin.³ Clinically significant macular oedema (CSMO) is also associated with increasing duration of diabetes. It is more common in older onset diabetic patients and develops particularly in the first few years after diagnosis.⁴ In patients diagnosed as having diabetes before the age of 30 years, the incidence of DR after 10 years is 50%, after 30 years 90% and after more than 25 years of diabetes 26% will have the proliferative form of retinopathy.⁵ Puberty and pregnancy both stimulate the development of retinopathy.⁶ Systemic hypertension, renal disease and anaemia, if associated with other major risk factors.^{2,7}

Clinical appearance of the Ocular disease:

Large scale prospective studies such as Diabetic Retinopathy Study (DRS),⁸ the Early Treatment Diabetic Retinopathy Study (EmRS),⁹ the Diabetic Retinopathy Yitrectomy Study (DRYS)¹⁰ and the Wisconsin Epidemiological Study of Diabetic Retinopathy (WESDR),¹¹ have done much to clarify the natural history of DR. They form the basis of the guidelines formulated by the European Working Party on screening for DR,¹² which are applicable to retinal screening in the hospital community and have been stratified to indicate the urgency needed for referral to an Ophthalmologist. Critical signs of DR that can be used to grade its severity and likely progression may be grouped as follows:

I. Mild Non-proliferative/Background DR :

- Microaneurysms
- Scattered hard exudates
- Intraretinal haemorrhages (Dot & Blot or Flame shaped)
- Cotton -wool spots (<5)
- Venous dilatation

II. Moderate to Severe Non-proliferative DR :

- Rapid increase in micro aneurismal count
- Intraretinal microvascular abnormalities (IRMAs)
- Multiple haemorrhages
- Cotton wool spots (>5)
- Venous beading, looping and reduplication

III. Proliferative DR :

- Optic disc neovascularization (NVD -new vessels at disc)
- Retinal neovascularization (NVE -new vessels elsewhere)
- Fibrous proliferation
- Pre-retinal Haemorrhage
- Vitreous Haemorrhage

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IV. Diabetic Maculopathy :

- Macular Oedema
- Ischaemic Maculopathy

V. Advanced Diabetic Ophthalmopathy:

- Retinal Detachment
- Rubeosis Iridis
- Neovascular Glaucoma

Retinopathy, before the formation of new vessels, the non-proliferative stage does not threaten vision per se but signals the need to exclude more sinister lesions and to follow up the patient in future. Changes involving the macular area however profoundly affect the central vision. Clinically significant macular oedema, an essential indication for referral and macular laser treatment, is defined as:

- Retinal oedema I thickening within 500um of the centre fovea
- Hard exudates within 500um of fovea, if associated with adjacent thickening
- Retinal oedema that is one disc area (1500um) or larger, any part of which is within one disc diameter of the centre of fovea.⁹

Neovascularization is the hallmark of proliferative disease and warrants urgent referral for its treatment owing to the impending risk of haemorrhage into the vitreous gel or retrohyaloid space.

The ocular complications of diabetes have varied expression in the lens, iris and retina. This diversity reflects the different responses of each of these tissues, at the cellular level, to the initial metabolic insult, namely the toxic effects of glucose. The pathogenesis thus involves several overlapping mechanisms details of which are beyond the scope of this discussion.

Every diabetic patient deserves the benefit of a comprehensive ocular evaluation. Careful attention need be paid to determine the presence of symptoms of DR such as decreased vision, distortion of vision, loss of color vision and the presence of floaters. However, it is vital to remember that even extensive proliferative changes may cause no visual symptoms until vitreous haemorrhage or retinal detachment occurs. Assessment of the best corrected visual acuity (both distant as well as near), a detailed slit-lamp examination, measurement of the intra-ocular pressure, checking the pupillary reflexes for a relative afferent defect, noting the ocular movements and funduscopy must essentially be incorporated in the routine examination of eye in diabetic patients. Fundus examination must

always be performed through maximally dilated pupil (unless contraindicated). The retinal periphery should be meticulously examined as approximately 27% of retinal abnormalities are found outside the central 45-degree area. Hence, diabetic patients are best examined using binocular indirect ophthalmoscopy or slit lamp biomicroscopy with a fundus contact lens or a + 78 D lens. Fundus Fluorescein Angiography (FF A) and Color Fundus Photography are ancillary tests that are commonly used.

The ability to recognize the clinical features of diabetic eye disease is critical in determining the severity and likely progression of DR in a given patient as well as the timing and nature of treatment required and the visual prognosis.¹³

Laser photocoagulation is now of indisputable value in treating the two major threats to the vision of a diabetic patient, namely, proliferative retinopathy and macular oedema. The DRS¹⁴ demonstrated beyond all doubt that Pametinal Photocoagulation (PRP) reduces the risk of serious visual loss in proliferative retinopathy by 50% as compared with untreated control eyes. In patients with CSMO the overall risk of severe visual loss in treated eyes (following Focal or Grid treatment of the macula) was less than half of that in control eyes.⁹ Closed vitreo-retinal surgery employs intraocular, microsurgery and endolaser photocoagulation. Vitreous and any contained haemorrhage can be removed, together with vascularized epiretinal membranes; tears in the retina are repaired and detachments if any reattached. Post-operative visual recovery can be dramatic and sustained, even in eyes that would until recently have been considered irretrievably blind.^{10,15} Currently the pooled success rate for anatomical and functional success is around 65- 70%.¹⁶

The need for vitrectomy would largely disappear if adequate laser photocoagulation were applied early enough. This ideal can be achieved if diabetic patients are regularly and methodically screened for eye disease. Ultimately the visual prognosis can only be improved by more effective surveillance of the diabetic population¹⁷ and better understanding of the systemic factors that influence the development and progress of DR together with application of advances in laser photocoagulation¹⁴ and closed intraocular vitreo-retinal surgical techniques.¹⁵

Nonetheless, the early recognition of sight threatening lesions and their precursors remains the key factor in proper management. Effective delivery of eye care has been shown to prevent visual loss and to be cost effective for subjects with either IDDM or NIDDM.¹⁸ However, this may prove difficult in view of the wide range of ophthalmic signs and the frequently subtle and highly localized nature of high risk lesions. For example, proliferative DR is often a symptomatic and difficult to detect accurately by non-specialists and pametinal photocoagulation treatment has been proven effective in preventing visual loss, especially if given early. It is therefore important for practitioners to be aware of the best time to refer diabetics under their care to ophthalmologists. Information on the relationship of incidence to the duration and control of diabetes is also vital in determining practical guidelines for ophthalmic care. Rational recommendations have been made regarding screening for retinopathy in the diabetic population. These subjects require a careful detailed ophthalmological examination at the time of diagnosis of diabetes followed by regular annual or more frequent review as determined by the findings on examination. These general recommendations will obviously be modified according to the individual patients condition and needs. An effective referral strategy such as the one outlined below may be formulated keeping in view the features of nonproliferative DR that strongly predict the risk of progression and those of the proliferative stage that require intervention.¹⁹

Immediate Referral (same/next day):

- Retinal Detachment
- Vitreous Haemorrhage

Urgent Referral (1 week):

- Advanced Ophthalmopathy
- Neovascular Glaucoma, Rubeosis Iridis
- Proliferative DR

Neovascularization (NVD/NVE), Fibrous tissue, Pre-retinal Haemorrhage

-CSMO

-Rapid fall in visual acuity

Early Referral: few-weeks

-Moderate to Severe Non-proliferative DR

-Diabetic Maculopathy

Routine Referral: few months

-Mild Non-proliferative DR

-Cataract

Robust epidemiological data are essential for estimating the frequency, development, progression and severity of DR in a given population. There exist wide ethnic and racial variations. Unfortunately, relevant data are lacking from Southern Libya. Such data are also needed in order to predict the demand for medical counseling and rehabilitation services, for developing screening programmes, for projecting costs and for measuring temporal trends in the disease and in the outcome of its treatment. Moreover, causal and risk factors may be identified raising the possibilities that they might be modified to ameliorate or prevent DR. The progressive nature of diabetic ophthalmopathy and the variety of factors influencing its progression require repeated examination and a high level of ophthalmoscopic expertise in those responsible for the clinical care of diabetic patients. The advent and development of laser photocoagulation and vitreoretinal intraocular microsurgical techniques enhance greatly the reduction in morbidity and help to restore vision in some eyes with blindness that until a few years ago would have been labeled untreatable. At the same time the immense importance of early detection and monitoring of diabetic eye disease and the relevance of ophthalmological referrals at the optimal time cannot be overemphasized. Such measures will go a long way towards eliminating and preventing blindness in diabetic patients.

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