Volume : 4 | Issue : 7 | July 2015 • ISSN No 2277 - 8179

Research Paper

Profile Of Diabetic Retinopathy In A Tertiary Care Centre

Medical Science

KEYWORDS : diabetic retinopathy, preventable blindness, urban south Indian, hypertension

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ABSTRACT

AIM: To investigate the prevalence and determinants of diabetic retinopathy in a tertiary care centre in south India.

INTRODUCTION: Diabetes Mellitus (DM) is a leading cause of preventable blindness in developing and developed countries. Diabetic Retinopathy (DR) is a specific microvascular complication of DM. Our study intends to outline the magnitude of the DR problem in our community.
METHODS: Of the 1143 patients that attended OPD, 111 had DM. Identified patients underwent a battery of examinations and relevant blood investigations.
RESULT: Prevalence of DR amongst those screened was 48.64%. The retinopathy profile showed 9.90% cases of mild non proliferative diabetic retinopathy, 14.41 of moderate non proliferative diabetic retinopathy, 7.20% severe non proliferative diabetic retinopathy, 17.11% proliferative diabetic retinopathy, 14.41% macular oedema.
CONCLUSION: The prevalence of DR in urban south Indian population is 48.64% and is strongly associated with hypertension.

INTRODUCTION:

The population of adults in the world with diabetes is constantly on the rise and the toll is likely to increase by 122% (135 million in 1995 to 300 million in 2025). This increase is expected to be 42% in the developed world and 170% in developing countries. India ranks first with 195%, with a prevalence of 18 million in 1995 and with an expectant increase to 54 million in 2025) [1]. Invariably, the cases of diabetic retinopathy are on the rise. This metabolic disorder could be a result of defective insulin secretion, defective insulin action, or both. With passage of time, higher blood glucose concentrations may lead to the development of microvascular complications such as retinopathy, nephropathy, and neuropathy. Two common types of diabetes are recognised, insulin-dependent diabetes mellitus (IDDM), and non insulin-dependent diabetes mellitus (NIDDM). Glycated haemoglobin (HbA1c) is often used as an indicator of blood glucose levels. It measures the long-term glucose concentration in the blood plasma and is an important parameter for the follow up of diabetes treatment. There is a recommendation that HbA_{1c} of 7% or lower be the target for glycaemic control, whereas in selected patients, there may be some benefit in setting a lower target of 6.5% ([2]).

Diabetic Retinopathy is likely to pose a formidable health challenge in the times to come. This sight threatening condition has been defined as the presence of typical retinal microvascular lesions in an individual with diabetes. With the passage of time, it may lead to a chronic state of blindness. Similar to other diabetic complications, this condition develops with increasing duration of diabetes and is consequently more common in older patients- associated risk factors being a chronic state of uncontrolled blood glucose level, the presence of nephropathy, and hypertension. The earliest lesions, encompassing the term non-proliferative retinopathy (NPDR) include microaneurysms, haemorrhages, hard exudates, cotton wool spots, intraretinal microvascular abnormalities (IRMAs) and venous beading (VB). The proliferative stage (PDR) is characterised by the growth of new vessels and fibrous tissue and pre-retinal or vitreous haemorrhage. New vessels at or within one disc diameter of the disc are termed as new vessels on the disc (NVD) and in other locations are called new vessels elsewhere (NVE). Leakage from macular capillaries results in macular oedema, and is termed clinically significant macular oedema (CSME) when present close to the central macula.

METHODS:

Of the 1143 consecutive patients that attended the ophthalmology OPD, 111 were found to be diabetic. They either presented with visual complaints or were referred to our department, as a part of a routine screening procedure for diabetic retinopathy. A comprehensive examination was conducted, with investigations relevant to diabetic retinopathy being conducted.([3]) A questionnaire was completed for each patient on which was recorded the name, age, sex, hospital number, duration of diabetes, treatment- whether on oral hypoglycaemic agents or insulin or managed by a controlled diet alone, glycaemic control, significant family history, associated complications- neuropathy, nephropathy. An enquiry into lifestyle, addictions- smoking, alcohol history, associated risk factors- hypertension, dyslipidemia, obesity, pregnancy was made. Blood was collected for relevant investigations like FBS, PPBS, glycosylated haemoglobin, urea, creatinine. Urine was collected to test for microalbuminuria. These eligible subjects who were identified as diabetics underwent a battery of examinations including visual acuity testing- best corrected visual acuity testing was performed using a Snellen's chart, slit lamp biomicroscopy, dilated fundus examination using direct as well as indirect ophthalmoscopy, fundus photography, FFA, OCT, IOP(using applanation tonometry). As a consequence of limited resources and a large number of patients, fundus photography, OCT, FFA was done only in patients with evidence of retinopathy. The diagnosis of Diabetic retinopathy was based on the Early Treatment Diabetic Retinopathy Study scale.

RESULT: Complete records were available for the 111 patients who have been a part of the study. Prevalence of diabetes in patients attending the OPD was 9.71%. Prevalence of diabetic retinopathy amongst those screened for diabetes was 48.64%. Majority of these patients were males (63.97%). The mean age at presentation was 53 years (range 17-70 years). The duration of diabetes ranged from those recently diagnosed to 30 years. A majority of patients with visual complaints had their diminution of vision attributable to diabetic retinopathy changes in the eye as compared to senile cataractous changes. The retinopathy profile showed 9.90% cases of mild non proliferative diabetic retinopathy, 14.41 of moderate non proliferative diabetic retinopathy, 7.20% severe non proliferative diabetic retinopathy, 17.11% proliferative diabetic retinopathy, 14.41% macular oedema. Hypertension as a risk factor was associated with 44.14% cases.

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Discussion: We cannot prevent the onset of diabetic retinopathy, but early detection by screening and appropriate, timely intervention can help minimise visual handicap. The progression of Diabetic Retinopathy begins with background retinopathy (BR), which is characterized by the presence of microaneurysms, enlargement of veins, retinal bleeding, retinal oedema, and exudates. The disease becomes sight-threatening once the patient progresses to proliferative diabetic retinopathy (PDR) or develops diabetic macular oedema (DMO). Proliferative diabetic retinopathy (PDR) is the most common cause of visual loss in type I diabetics. This phase is characterised by development of new blood vessels, which are fragile in nature and severe haemorrhage into the vitreous. When left untreated, they can lead to development of fibrous tissue, that causes distortion of the retinal architecture and consequently causes tractional retinal detachment. These new fragile blood vessels may also bleed, which worsens the preretinal or vitreous haemorrhage. In type II diabetics, diabetic macular oedema is the commonest cause of visual loss. There is no individual retinopathy sign that is specific for diabetic retinopathy- these features could also be a part of some other disease process. The pattern, symmetry and evolution of the retinal lesions characterise diabetic retinopathy.

The altered glucose metabolism seen in diabetes has been linked by biochemical pathways to the development and progression of diabetic retinopathy. A multifactorial biochemical pathogenesis is plausible, involving products of the aldose reductase pathway, increased nonenzymatic glycation of proteins, activated protein kinase C with increased vasodilatory prostaglandins, and increased production of growth factors in the retina. The risk of progression, associated with the severity of individual lesions from photographic grading has been quantified by the ETDRS and a seven level classification has been devised: No retinopathy, Minimal, Mild, Moderate and Severe NPDR, PDR and High-Risk PDR. ([4])

Diabetic retinopathy can be graded with the Early Treatment Diabetic Retinopathy Scale (ETDRS)-

International Clinical Diabetic Retinopathy and Diabetic Macula Oedema Disease Severity Scale-

Mild NPDR: Microaneurysms only

Moderate NPDR: More than just microaneurysms but less than severe NPDR

Severe NPDR: Any of the following:
1. More than 20 intraretinal haemorrhages in each of 4 quadrants
2. Definite venous beading in 2 or more quadrants
3. Prominent intraretinal microvascular abnormalities in 1 or more quadrants

Proliferative DR (PDR): One of the following:
1. Neovascularisation
2. Vitreous/preretinal haemorrhage

Advanced Diabetic Eye Disease (ADED)

One of the following:
1. Formation of fibrovascular tissue proliferation
2. Traction retinal detachment due to formation of posterior vitreous detachment
3. Dragging of retinal/distortion
4. Rhegmatogenous retinal detachment

Macula Oedema Findings on Ophthalmoscopy:
- Mild – some retinal thickening or hard exudates in posterior pole but distant from the macula
- Moderate – retinal thickening or hard exudates approaching the centre of the macula but not involving the centre
- Severe – retinal thickening or hard exudates involving the centre of the macula

It should be mandatory to screen patients with diabetes for retinopathy on a regular basis. As a norm, patients with type I diabetes, who have not yet developed changes of retinopathy are screened every second year, while the corresponding patients with type II diabetes are screened every third year. When retinopathy is detected, the screening is performed more frequently.

Special attention needs to be given to the modifiable risk factors – such as glycaemic control, hypertension and lipids in the management of diabetic retinopathy ([5, 6]). Better glycaemic control reduces risks of microvascular complications([7]). Closer follow-ups should be scheduled, once retinopathy changes are evident.

The role of pupil dilatation in fundus evaluation for screening cannot be exaggerated. Short-term pupil dilatation with tropicamide 0.5% eye drops is safe, and patient acceptance is very high. With sunglasses, most people can drive safely after pupils are dilated. Fluorescein angiography as a tool for screening in diabetic retinopathy is inappropriate, as it is invasive and has a risk of complications. Where patient compliance is a concern, and where retinopathy is progressive, retinal laser photocoagulation can be given due consideration. Pan Retinal photocoagulation (PRP) laser treatment reduces the risk of vision loss in PDR. Intravitreal Anti VEGF injections can be useful in proliferative diabetic retinopathy e.g. it can be given before contemplating vitrectomy or if there is vitreous haemorrhage. Improved visual results have been reported during the last 20 years following vitrectomy, the most recent being from Yorston [8]. Prior to vitrectomy, PRP should always be attempted to reduce activity of new vessels as much as possible.

Conclusion:
Diabetic retinopathy is a major health problem in patients with type 2 diabetes, with diverse heath and economic implications. The key to reducing visual loss and blindness from diabetic retinopathy is early detection by regular eye examination. The duration of diabetes and glycaemic control are independent risk factors for severity and progression of diabetic retinopathy. In our study, the prevalence of diabetic retinopathy in urban south Indian population is 48.64% and is strongly associated with hypertension.

This study intends to outline the prevalence of retinopathy in a cohort of south Indian diabetic patients attending the ophthalmology opd, who were screened for retinopathy- irrespective of the presence of visual symptoms or the duration of diabetes. Effort should be made to control hyperglycemia and hypertension tightly by appropriate therapeutic measures, so that the occurrence and worsening of the retinopathy can be alleviated. Diabetic eye disease is a significant problem and we recommend routine screening be implemented for diabetic retinopathy at medical and diabetic clinics.

REFERENCE

1.King H, Aubert RE, Herman WH: Global burden of diabetes, 1995-2025 prevalence, numerical Estimates and projection. | Diabetes Care 1998 21:1414-312 American Diabetes Association. Standards of medical care in diabetes--2013. Diabetes Care 2013;36 Suppl 1:S11-66. | 3 American Academy of Ophthalmology Preferred Practice Patterns Committee. Preferred Practice Pattern® Guidelines. Comprehensive Adult Medical Eye Evaluation. San Francisco, CA: American Academy of Ophthalmology; 2010 | 4 Source: Wilkinson CP, Ferris FL III, Klein RE, et al. Proposed international clinical diabetic retinopathy and diabetic macular edema disease severity scales. Ophthalmology 2003; 110:1679-80. | 5 Matthews DR, Stratton IM, Aldington SJ, Holman RR, Kohner EM. Risks of progression of retinopathy and vision loss related to tight blood pressure control in type 2 diabetes mellitus: UKPDS 69. Arch Ophthalmol. 2004;122(11):1631–40. | 6 UK Prospective Diabetes Study (UKPDS) Group. Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). Lancet. 1998;352(9131):837–53. | | 7 Chase HP, Garg SK, Jackson WE, Thomas MA, Harris S, Marshall G, et al. Blood pressure and retinopathy in type I diabetes. Ophthalmology. 1990;97(2):155–9. | 8 Yorston D, Wickham L, Benson S, Bunce C, Sheard R, Charteris D. Predictive clinical features and outcomes of vitrectomy for proliferative diabetic retinopathy. Br J Ophthalmol. | 2008;92(3):365–8. |