Original article:

A epidemiologic study of diabetic retinopathy with insulin independent diabetes in tertiary centre

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Abstract

Introduction: To determine prevalence of diabetic retinopathy and to identify possible risk factors for diabetic retinopathy with type 2 diabetes

Methodology: During the study 250 type 2 diabetic subjects were screened during Aug12 to Sept 2014. All were evaluated for retinopathy by slit lamp biomicroscopy fundus photography and fluorescein angiography.

Results: Overall mean age of the subjects was 51 years with a male: female ratio of 2.4:1.The diabetic retinopathy of any grade was detected 34.4 % (86 subjects out of 250). Out of 172 eyes, 62.8% had NPDR, 37.8% had PDR. CSME was seen in 52.9%.

Conclusion: People with diabetes mellitus should be encouraged to maintain good glycaemic control and undergo regular fundus screening to delay or prevent the development of diabetic retinopathy.

Introduction

Diabetic retinopathy (DR) is the leading cause of blindness in working-age population .There is no available curative treatment for this costly disease. Concomitant systemic diseases are known to aggravate DR and increase the risk of visual loss through DME and PDR The main aim of the study is to find out the frequency of the diabetic retinopathy among patients with type 2 diabetes along with the identification of possible risk factors.

Material and methods

It was a hospital based observational study, conducted between August 2012 and September 2014 and included:

1. Patients of type 2 DM attending eye OPD with ocular complaints.
2. Diabetic patients attending diabetic clinic in medicine OPD.
3. Patients of diabetic retinopathy referred to our Retina clinic.

Inclusion criteria

1. Presence of retinopathy attributable to type 2 diabetes mellitus.
2. Patients able and willing to give informed consent to participate in the study.

Exclusion criteria

1. Patients of Type 1diabetes mellitus; gestational diabetes
2. FFA not possible either due to medical reasons or refusals
3. Hazy ocular media precluding a good view of the retina
4. Patients on insulin treatment

Case selection

After applying above exclusion criteria, out of 250 patients examined ophthalmoscopically, 86 patients with confirmed diagnosis of diabetic retinopathy

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(any grade), attributable to type 2 diabetes mellitus were included in our study. In all patients selected for this study, a uniform pattern of history taking and examination were followed.

Assessment of diabetic retinopathy

Grading of diabetic retinopathy – on the basis of abbreviated ETDRS severity scale-

1. Non-proliferative diabetic retinopathy [NPDR]-
   a. Mild.
   b. Moderate.
   c. Severe.
2. Proliferative diabetic retinopathy [PDR] –
   a. Early PDR.
   b. High risk PDR.

Clinically significant macular edema – (as defined by ETDRS).

CSME was defined upon slit lamp biomicroscopy as :

(1) Thickening of the retina at or within 500 µm of the center of the macula

(2) Hard exudates at or within 500 µm of the center of the macula associated with thickening of adjacent retina

(3) A zone of retinal thickening 1 disc area or larger, any part of which is within 1 disc diameter of the center of the macula

Fundus photographs were taken using TOPCON 50Dx fundus camera to keep record.

Investigations

Each subject was evaluated for systemic diseases with special attention to hypertension, renal disease, anemia and hyperlipidaemia, ischemic heart diseases.

1. **Blood pressure** Systemic hypertension >140 mm Hg
   Diastolic blood pressure >90 mm Hg,
   or On systemic antihypertensive medications.
2. **IHD** based on evidence of previous myocardial infarction or ischemic changes (elevation/depression of S-T segment, inversion of T-wave) on ECG supported by clinical history and/or echocardiogram, or a history of cardiovascular surgery or angioplasty for IHD.
3. **Hyperlipidaemia** - fasting total plasma cholesterol of > 200 mg/dL
4. **Nephropathy**- Urine albumin > 1+ (30 mg/dL, indicating gross proteinuria and/or Blood urea > 40 mg /dL and/or Serum creatinine >1.5 mg/dL
5. **Anemia** - hemoglobin < 12gm/dl in females and < 13gm/dl

Observations

In our study, a total of 250 cases of type 2 DM were examined. Of these, only 86 patients showed clinical evidence of diabetic retinopathy on ophthalmoscopy. So the prevalence of DR in our study was 34.4%.

Table 1- Prevalence of diabetic retinopathy

S. No.		PATIENTS	
		NUMBER	PERCENTAGE
1.	Total number of patients of type 2 DM patients examined	250	100%
2.	Diabetic retinopathy present	86	34.4%

Table 2 - Age distribution

S. No.	AGE GROUP	PATIENTS	
		NUMBER	PERCENTAGE
1	40-49 years	17	19.76 %
2.	50-59 years	40	46.33%
3.	>60 years	29	33.72 %
	TOTAL	86	100 %

The age range of patients in our study varied from 40 to 70 years. We categorized patients according to age groups and observed that maximum number of patients (46.33%) belonged to the age group of 50-59 years.

Table 3- Mean age

CASES	MEAN AGE
Patients with no DR	47.5years
Patients with DR	51 years

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The mean age of patients with DR was 51 years while that of patients with no DR was 47.5 yea

Table 4- Sex distribution

S.No.	SEX	PATIENTS	
		NUMBER	PERCENTAGE
1.	Male	61	70.93%
2.	Female	25	20.06%
	TOTAL	86	100 %

In our study, majority of the patients (70.93 %) were males, with a male: female ratio of 2.4:1

Table 5- Diabetic retinopathy and duration of diabetes

S.No.	DURATION OF DIABETES	NUMBER	PERCENTAGE
1.	< 5years	41	47.67%
2.	5 -10 years	30	34.88%
3.	10 – 20 years	15	17.44%
4.	> 20 years	00	00%
	TOTAL	86	100%

In our study duration of diabetes ranged from newly diagnosed cases to 20 years in with most patients (47.67%) having duration of diabetes less than 5 years.

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Table 6- Grading of diabetic retinopathy according to ETDRS classification

	NPDR (n=114; 62.2%) EYES			**PDR**
	MILD	**MODERATE**	**SEVERE**	
No. of Eyes	25	62	27	58
% of Eyes	15.69%	36.04%	14.53%	37.8%

A total of 172 eyes of 86 patients were examined and severity of retinopathy was graded according to the abbreviated ETDRS classification. NPDR was seen in 62.2% cases amongst whom, moderate NPDR was most common(36.04%). PDR was seen in 37.8% of eyes.

Table 7- Incidence of CSME and non CSME

S. No.		**EYES**	
		NUMBER (n)	**PERCENTAGE (%)**
1.	CSME	91	52.90%
2.	NON CSME	81	47.09%
	TOTAL	172	100%

Clinically significant macular edema was seen in 52.90% of eyes in the present study

Discussion

Diabetes is a major public health problem in the world. The ability of laser therapy to stabilize or restore the visual acuity in diffuse macular edema and focal macular edema is not amenable to ischemic maculopathy. For this reason, identification of the risk factors for ischemic maculopathy may allow better management of this complication of DR. The goal of the present study was to determine systemic factors that may be associated with an increased risk of macular ischemia in DR patients compared with patients having focal and diffuse macular edema.

In our study the prevalence of diabetic retinopathy was 34.4% that is similar to the studies conducted by Romero-Aroca P et al (2006), Eckhard Zander et al (2000) who found 27.48% and 38% prevalence of DR in their studies respectively.In our study all patients were above 40 years with peak incidence of DR (46.33 %) being in the age group of 50-59 years. These findings are consistent with the studies conducted by Waseem Ullah Memon (2012) who found that Highest distribution 56/151 (37%) of diabetic retinopathy belonged to the age group of 50-59 years.In our study sex ratio is 2.4:1. Of the total 86 patients studied, majority of the patients (70.93 %) were males, which was comparable with the findings (sex ratio 2: 1) of a

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clinic cohort in Chennai. A similar preponderance has been reported by Rema M et al.The duration of diabetes is probably the strongest predictor for development and progression of retinopathy. In our study duration of diabetes ranged between newly diagnosed cases to 20 years duration with majority of cases (47.67%) having duration less than 5 years. A study by Dandona et al reported mean duration of diabetes 16 years .A possible reason for this discrepancy could be that we had a large number of patients directly referred to us from diabetic clinic in medicine OPD that lead to an early detection of DR cases in our study .

In our study Out of total 172 eyes examined, mild NPDR was seen in 15.69% of eyes , moderate NPDR presents in 36.04% of eyes , severe 14.53% NPDR found in of the eyes while PDR was seen in 37.8% of eyes . A study by Rema M et al report prevalence of 30.8 percent with NPDR, 3.4 per cent with PDR and 6.4per cent had DME.In our study, 52.90% of patients of diabetic retinopathy had clinically significant macular edema, which is similar to study by Eckhard Zander et al (2000) who found 53% patients with CSME. Romero-Aroca P et al reports prevalence of diabetic macular edema 7.15% in 1993 and 7.86% in 2006 in Type 2 patients.

Conclusion

At the completion of study, data was analyzed and following conclusions were drawn-

- ✓ Incidence of diabetic retinopathy cases was maximum in 51-60 years of age group.
- ✓ The mean age of patients with DR was 51 years while that of patients with no DR was 47.5 years
- ✓ Majority of the patients (70.93 %) were males, and male: female ratio was 2.4:1
- ✓ In our study duration of diabetes ranged from newly diagnosed cases to 20 years.
- ✓ Maximum number of patients (47.67%) had duration of diabetes less than 5 years.
- ✓ The prevalence of DR in our study was 34.4%.
- ✓ Total of 172 eyes of 86 patients were examined and severity of retinopathy was graded according to the abbreviated ETDRS classification.
- ✓ NPDR was seen in 62.2% of eyes amongst whom, moderate NPDR was most common (36.04%). PDR was seen in 37.8% of eyes.
- ✓ Clinically significant macular edema was seen in 52.90% of eyes in the present study.
- ✓ Various systemic risk factors like hyperglycaemia, hyperlipidaemia, hypertension, nephropathy, ischemic heart disease, stroke, peripheral vascular disease were studied in all patients.

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