<u>Original article</u>

Retinopathy in Newly Diagnosed Type 2 Diabetics with a special stress on the importance of glycemic control.

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Abstract:

Background: Diabetes mellitus (DM) is a major health problem with long-term microvascular and macrovascular complications responsible for the majority of its mortality and morbidity. The development and progression of diabetic complications are strongly related to the degree of glycemic control. The purpose of this study was to study, the incidence of retinopathy in newly diagnosed diabetics and its association with various risk factors with a special stress on role of HbA1c levels. *Methods*: We analysed 300 newly diagnosed type2 diabetics (diagnosed within 6 months). Patients were subject to detailed history, examination (including retinal examination), and investigations including serum creatinine, urinary micro-albumin, 24 hours urinary protein, HbA1c and ultrasonography. *Results*: Incidence of retinopathy in newly diagnosed type 2 diabetics was 30% (91/300). With increase in HbA1c, the incidence of retinopathy increased. All results were statistically proven. *Conclusion*: Incidence of retinopathy in newly diagnosed type2 diabetics is as high as 30%. Glycemic control is the an important factor contributing to development of this microvascular complications in diabetic patients.

Key words: retinopathy; glycemic control; type II diabetes

Background:

Diabetes mellitus (DM) is the most prevalent metabolic, non communicable disorder in the world. The increasing prevalence of diabetes is a global problem and, it is unfortunately a major one in developing countries such as India. The world wide prevalence of DM has risen dramatically over the past two decades from an estimated 30 million cases in 1985 to 177 million in 2000[1-3]. Based on current trends >360 million individuals will have DM by the year 2030.

Although the prevalence of both type 1 and type 2 DM is increasing worldwide, the prevalence of type 2 D.M. is rising much more rapidly [3-5].

The chronic complications of DM affect many organ systems and are responsible for the majority of morbidity and mortality associated with the disease [5,6]. Chronic complications of DM are :-

1. Micro vascular

    Retinopathy

    Neuropathy

    Nephropathy

2. Macro vascular

    Coronary artery disease

    Peripheral vascular disease

    Cerebro vascular disease

This study aims to study the incidence of retinopathy in newly diagnosed

diabetics with a special stress on the effect of glycemic control on this complication.

Material and Methods:

This study was conducted on subjects attending the diabetes clinic in the Department of Medicine, as well as the general medicine OPD and the patients admitted in the wards of Department of Medicine, MLB Medical College, Jhansi.

The study was performed on group of 300 newly diagnosed diabetics. The criteria for diagnosing diabetes were the same as laid down by WHO.

1. Symptoms of DM plus RBS > 200mg/dl.

2. Fasting plasma glucose >126 mg/dl.

3. Two hour plasma glucose >200mg/dl during an

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oral glucose tolerance test. Patients having diabetes for more than 6 months and newly diagnosed diabetics with a preexisting renal, retinal or neurovascular disease, due to some other pathology were not included in the study.

The patients were subject to detailed history and examination Part of the examination included an assessment of neurological function including neuropathic symptoms and physical signs, vibration perception threshold, tests of autonomic function and the prevalence of impotence, and fundus examination.

Laboratory tests included complete urinalysis, 24 hour urinary protein, urinary micralb, HbA_1C, lipid profile, ultrasonography abdomen + pelvis, percutaneous renal biopsy (when required). The patients were followed for the next six months. Approval of ethical committee was taken for the study and consent from each patient was obtained.

Statistical method used was CHI SQUARE test. The statistical analysis was done using SPSS (Statistical Package for Social Sciences) Version 15.0 statistical Analysis Software. The values were represented in Number (%) and Mean±SD. P value was calculated and correlated with level of significance. Level of significance: "p" value has been taken as the level of significance.

p > 0.05   Not significant
p <0.05   Significant
p <0.01   Highly significant
p <0.001   Very highly significant

Results :

300 patients of newly diagnosed diabetes, were studied form Jan 2008 to August 2009. Of the 300 patients studied, 204 were male and 96 were female. The incidence retinopathy in newly diagnosed type 2 diabetics was 30%.

Incidence of retinopathy increased with increase in HbA_1C levels. (table 1).

It was 0% at HbA_1C <7, 12.9% at HbA_1c 7-7.99, 35.29% at HbA_1c 8-9 and 95% at HbA_1c >9. P value was <0.01, highly significant.

Incidence of retinopathy also increased with increase in BMI(table 3). It was 7.14 at BMI <18.5, 55.5% at BMI 25-29.9 and 92.30% at BMI >30, P value was <0.001 and very highly significant. Similarly, incidence was Incidence of retinopathy increased significantly with increase in blood pressure (table4). It was 0% in group < 120/80 mmHg, 7.6% in blood pressure 120/80 – 139/89, and 100% at blood pres-

Table 1: Relationship of Diabetic Nephropathy with HbA1C

HbA1C	Total patients of DM	Retinopathy	Percentage
<7	17	0	0%
7- 7.99	93	12	12.90%
8-9	170	60	35.29%
>9	20	19	95%
Total	300	91	

p value < 0.01, highly significant

Table 2: Relationship of Diabetic retinopathy with Age

Age (in yrs)	Total patients of DM	Retinopathy	Percentage
<20	36	2	5.56
21-40	93	21	22.58
41-60	161	59	36.64
> 60	10	9	90
Total	300	91	

p value < 0.05, significant

Table 3: Relationship of Diabetic Nephropathy with BMI

BMI (kg/mt2)	Total patients of DM	Retinopathy	Percentage
<18.5	42	3	7.14
18.5-24.9	146	21	14.38
25-29.9	99	55	55.55
>30	13	12	92.30
Total	300	91	

p value < 0.001, very highly significant

Table 4: Relationship of Diabetic Nephropathy with Blood pressure

Blood pressure (mmHg)	Total patients of DM	Retinopathy	Percentage
<120/80	6	0	0.0
120/80-139/89	196	15	7.6%
140/90-159/99	92	70	76.08%
>160/100	6	6	100%
Total	300	91	

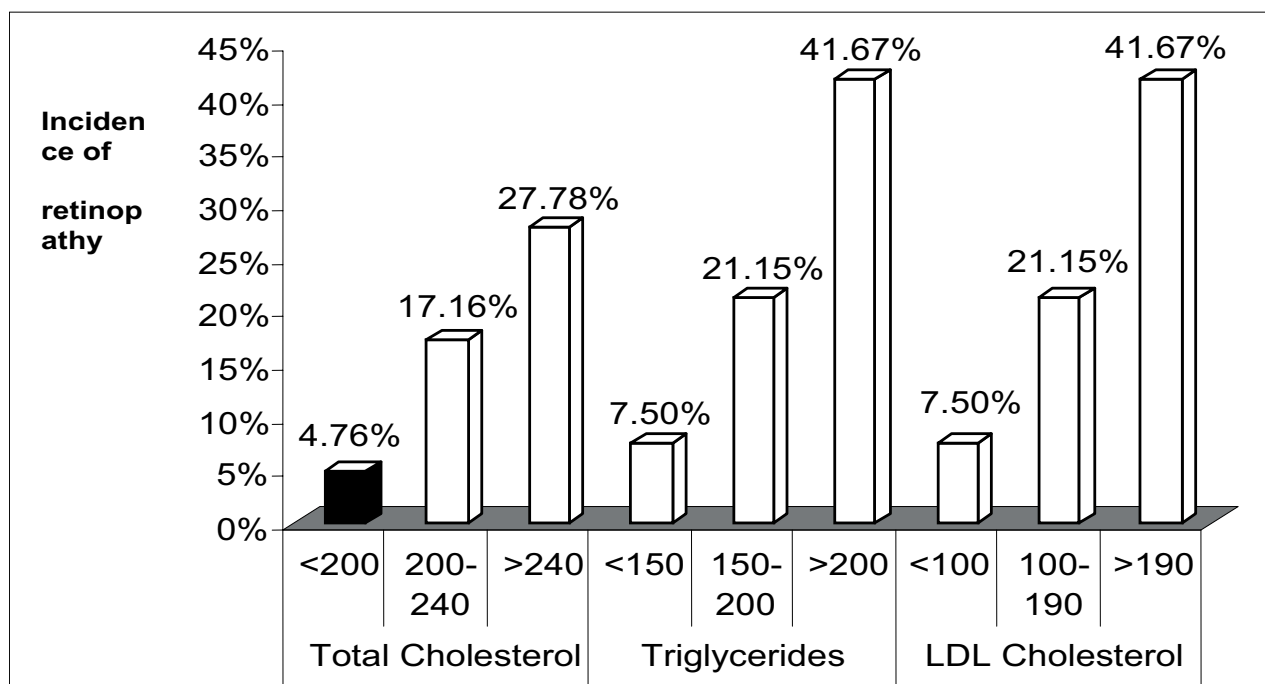p value < 0.001, very highly significant

Figure 1: Figure 1 showing Relationship of Diabetic retinopathy with Total Cholesterol Triglycerides & LDL cholesterol

sure >160/100mmHg. P value was < 0.001, and hence very highly significant.

Incidence of retinopathy increased with age (table. 2). It was 5.56% in age group <20 yrs and increased to 90% in age group >60 yrs. P value was <0.05 and was significant.

Retinopathy also increased with dyslipidemia. Dyslipidemia consisted of increased total cholesterol, serum triglycerides, LDL cholesterol and decreased HDL (Fig. 1). All the values were statistically proven.

Discussion:

Diabetic retinopathy is a dreaded complication of DM. Stress is being laid on its early detection. Earlier, it has been shown that retinopathy is present in about 28-30% of patients with newly diagnosed type 2 diabetes[1]. Our study shows that 30% patients developed retinopathy. This is in accordance with the previous reports.

Most of the patients in 40-60 yrs. age group developed retinopathy. The incidence of retinopathy is seen to increase consistently with age, suggesting the decrimental effect of age on development of retinopathy.

On considering BMI, 55.55% of patients with BMI 25-29.9 developed retinopathy. These findings are consistent with a study in England, that Indians are at increased risk of DM and its complications, at a relatively lower BMI, probably due to an excess total body fat composition, and because they are centrally obese. Retinopathy increased significantly with increase in HbA_1c[2,3]. This is consistent with UKPDS[4] study that showed that microvascular complications were benefited by better control of blood sugar levels[5,6]. Also, in accordance with the fact that diabetic retinopathy and blood pressure have a strong correlation[7,8]., in our study also incidence of retinopathy increased significantly with rise in blood pressure. And incidence of retinopathy increased significantly with increasing dyslipidemia. In conclusion, the incidence of retinopathy in newly diagnosed type 2 diabetics is as high as 30%. The incidence of retinopathy has significant correlation with poor glycemic control (high HbA_1c)[2,3], hypertension, sedentary life style (high BMI), dyslipidemia, age. The relationship between hypertension & development of diabetic retinopathy is highly significant and can be as high as 100%.

Key message:

This article highlites the importance of early detection of retinopathy in newly diagnosed diabetics. Also it shows significant correlation between glycemic control and development of retinopathy, that can help in identifying patients who are at greater risk of dceveloping retinopathy.

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