Original Article

Retinopathy in Type-2 Diabetes Mellitus

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FREQUENCY OF DIFFERENT GRADES OF RETINOPATHY IN TYPE-2 DIABETES MELLITUS PATIENTS AT MILITARY HOSPITAL RAWALPINDI

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ABSTRACT

Objective: To analyse the various types of retinopathy in individuals with type 2 DM.

Design: Descriptive study.

Place and duration of study: Military Hospital Rawalpindi from January 2010 to July 2010

Methods: One hundred and fifty patients with type 2 DM were studied into for different types of retinopathy, based on history, clinical examination (ophthalmological) and laboratory investigations.

Results: Out of 150 patients who fulfilled the criteria for study, 93(62%) were male and 57(38%) were female patients, frequency of retinopathy was 28.67%. The duration of diabetes ranged from 5 to 30 years. The frequency of retinopathy was higher in males as compared to females. The mean age of the patients was 51.10±8.33 years with range 36-77 years. Proliferative retinopathy was seen more in those diabetic patients whose duration of disease was more than 10 years. They also showed poor glycaemic control in the form of raised blood glucose and HbA1C levels.

Conclusion: About twenty eight percent of our diabetic patients are suffering from diabetic retinopathy. This can be controlled by early detection and effective treatment both in terms of strict glycemic control and laser photocoagulation, thus decreasing the morbidity and mortality due to this chronic disease.

Key words: Diabetes mellitus, Diabetic retinopathy.

INTRODUCTION

Diabetes Mellitus refers to a group of common metabolic disorders that share the phenotype of hyperglycemia. Several distinct types of DM exist and are caused by a complex interaction of genetic and environmental factors[1]. DM is classified on the basis of the pathologic process that leads to hyperglycemia. The two broad categories are type 1 and type 2. Type 2 DM is characterized by variable degree of insulin resistance, impaired insulin secretion and increased glucose production. The world wide prevalence of DM has increased dramatically over the past two decades, from an estimated 30 million cases in 1985 to 177 million in 2000. Based on the current trends,>360 million individuals will have diabetes by the year 2030[2].

Retinopathy is a major cause of morbidity in patients with diabetes. It remains the primary cause of blindness in most industrialized countries. Diabetic retinopathy was classified as

1. Non-proliferative: presence of microaneurysms, haemorrhages (dot, blot, flame shaped) or hard exudates seen in any quadrant of retina / CWS / dilation / beading of vessels.

2. Proliferative: presence of neovascularization of retina, iris or angle, pre-retinal or vitreous haemorrhage, and or tractional retinal detachment.

After 20 years of disease, evidence of retinopathy is present in almost 50-80% of those with type 2 diabetes mellitus[3]. The presence of severe retinopathy is also a risk factor for death due to ischemic heart diseases. The duration of diabetes is the most important predictor of retinopathy in diabetic patients. Prevalence of both background and proliferative retinopathy increases in direct proportion to the duration of diabetes[4]. The mechanism by which lack of glyceamic control predisposes to vascular disease is incompletely understood however chronic hyperglycemia is thought to be the primary cause of diabetic retinpathy[5].

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Because the rate of progression may be rapid and therapy is at least partially effective, it is also important to regularly screen diabetic patients for the development of retinal disease[6].

The purpose of this study was to ascertain the frequency of different types of retinopathy in patients of type 2 Diabetes Mellitus. So that in future, while treating diabetic patients proper counselling and preventive measures regarding prevention of this important complication of diabetes can be done to the patients and relatives.

PATIENTS AND METHODS

From January 2010 to June 2010, a total of 665 patients reporting to the medical OPD or admitted to medical wards at the Military Hospital / AFIO Rawalpindi, with the diagnosis of type 2 DM were screened and evaluated. A total of 150 fulfilled the inclusion criteria and were evaluated for the presence of retinopathy.

Inclusion Criteria

- Patients of age ≥35 years of both genders
- Patients with known diagnosis of type- 2 DM (≥ 5 years)

Exclusion Criteria

- Diagnosis of type-1 DM
- Patients of Cushing's disease, gestational DM, acromegaly, Down's syndrome, thyrotoxicosis, chronic renal failure, hypothyroidism, chronic liver disease
- Patients with clinical evidence of hypertension, angiopathy, connective tissue disease, infections
- Patients taking antihypertensives, antiplatelet or lipid lowering medications at the time of study

After obtaining informed consent, from all the patients, who reported at OPD/admitted in medical wards, detailed history was taken which included all necessary information like the type, onset, duration, treatment, nature of diabetes control, associated systemic diseases and ocular complications. It was followed by thorough physical examination to confirm the diagnosis of type-2 DM and detailed ophthalmological examination to look and confirm the type of retinopathy present in all patients

After adequately dilating the pupil using 1% mydriacyl, detailed fundus examination was carried out to look for presence of diabetic retinopathy and its type.

All the information from the patients was entered into a predesigned proforma having all the relevant details e.g., name, age, gender ,type of retinopathy etc.

Analytical Determination

The chemical profile of all patients was determined using BECKMAN COULTER DXC 600(UNICEL DXC 600 SYNCHRON CLINICAL ANALYZER,USA) at AFIP Rawalpindi.

Statistical Analysis

Using SPSS 15 descriptive statistics were used to describe the data i.e, mean and standard deviation for quantitative variables while frequency and percentage for qualitative variables.

RESULTS

Out of 150 patients who fulfilled the criteria, 93 (62%) were male and 57 (38%) were female patients. The mean age of the patients was 51.10 (SD=8.33) years. Minimum age was 36 years and maximum age was 77 years. The duration of diabetes ranged from 5 to 30 years. Out of these diabetic patients 43 had retinopathy giving on overall frequency 28.67% of retinopathy in diabetic patients. While 107 (71.3%) had normal fundoscopy.

The frequency of different types of retinopathy seen in these subjects are shown in the table 1.

DISCUSSION

Diabetes mellitus is the leading cause of blindness both in our country and globally between the ages of 20 and 74[2,7]. It is evident from the fact that diabetic patients are 25 times more likely to develop blindness than those who are normoglycemic[8]. Proliferative retinopathy and clinically significant macular edema are the main causes of blindness in these patients. Non-proliferative diabetic retinopathy usually appears late in the first decade or early

Table-1: Frequency of different types of retinopathy (n=150)

Findings of fundoscopy	Frequency	Percentage
Non- proliferative	27	18
Proliferative	16	10.7
Normal fundoscopy	107	71.3

Table-2: Comparison with the previous studies of prevalence of diabetic retinopathy in various countries

Country	Author	Year	No of subjects	Retinopathy (%)
India	Singh et al[19]	2001	52	48.1
Spain	Lopez et al[18]	2002	3544	20.9
Brazil	Gomes et al[16]	2002	50	31.3
South africa	Rotchford et al[14]	2002	203	40.3
Pakistan	Kyani H et al[15]	2003	540	33.3
Pakistan	Present study	2010	150	28.67

in the second decade of the disease and is marked by retinal microaneurysms, dot and blot hemorrhages and cotton wool spots. Mild non-proliferative retinopathy progress to more extensive disease, characterized by changes in the venous vessel caliber, intraretinal microvascular abnormalities, and more numerous microaneurysms and hemorrhages[9]. The pathophysiologic mechanism involved in the non-proliferative retinopathy include loss of retinal pericytes, increased retinal vascular permeability, alteration in retinal blood flow and occlusion of retinal microvasculature which lead to retinal ischemia. Neovascularization, a hallmark of proliferative retinopathy is the result of retinal hypoxia. These newly formed vessels are found near the optic nerve and/or macula and rupture easily, leading to vitreous haemorrhage, fibrosis and ultimately retinal detachment. Not all individuals with non-proliferative retinopathy develop proliferative retinopathy, but the more severe the non-proliferative disease, the greater the chance of evolution into proliferative retinopathy within 5 years. This creates an opportunity for the early detection and treatment of diabetic retinopathy[10].

Clinically significant macular edema can occur when only non-proliferative retinopathy is present. Flourescein angiography useful to detect macular edema, which is associated with 25% chance of moderate visual loss over the next three years[11,12].

Prevention is the most effective measure to reduce morbidity from diabetic retinopathy. Intensive glycaemic control will delay the development of diabetic retinopathy in diabetic patients. Individuals with known retinopathy are candidates for prophylactic photocoagulation when initiating intensive therapy. Less benefit is seen in case of advanced retinopathy by glycaemic control, though adequate ophthalmologic care can prevent most blindness[13].

Regular, comprehensive eye examinations are essential for all individuals with DM. Most diabetic eye disease can be successfully treated if detected early. Early detection and effective treatment in time like laser photocoagulation is very effective in preserving vision. Proliferative retinopathy is usually treated with panretinal laser photocoagulation[14,15].

CONCLUSION

Frequency of diabetic retinopathy in our study is 28.67% which is less as compared to previous studies carried out locally and abroad (Table 2)[14-16-19]. This may be because in our Army set up medical facilities are easily available for the early detection and prompt free treatment, complications can be effectively controlled. Thus we can say with full confidence that by regular strict glycaemic control and ophthalmological follow up visits, this important complication of diabetic retinopathy eg loss of vision / blindness can be minimized, thus decreasing mortality and morbidity due to this chronic disease. Therefore every diabetic patient and the family should be properly educated in detail, about the prevention and treatment of this complication of diabetes mellitus.

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