

ORIGINAL ARTICLE

FREQUENCY OF DIABETIC RETINOPATHY IN PATIENTS AFTER TEN YEARS OF DIAGNOSIS OF TYPE 2 DIABETES MELLITUS

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Background: Diabetic retinopathy is one of the most common and serious complications of type 2 diabetes mellitus and a leading cause of blindness not only in Pakistan but also worldwide. So we conducted this study to record the frequency of diabetic retinopathy in known diabetic patients ten years after diagnosis of type 2 diabetes mellitus. **Methods:** The study was conducted at Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan for a period of 1 year from January 2008 to January 2010. The study group comprised of 200 patients of type 2 diabetes mellitus attending the medical clinic. All patients who were diagnosed as type 2 diabetes mellitus since ten years duration were included in the study. Retinopathy was graded into background, pre proliferative and proliferative retinopathy. Type 2 diabetes was diagnosed using the WHO criteria. Statistical analysis was carried out using the SPSS-11. **Results:** Diabetic retinopathy was found in 25.5% of the total Type 2 patients after ten years of diagnosis, and of these 4% of patients had proliferative retinopathy. **Conclusion:** Type 2 diabetic patients should be screened as early as possible to prevent permanent visual loss by timely management of diabetic retinopathy because diabetes is one of most common preventable cause of blindness in the world.

Keywords: Retinopathy, Type 2 Diabetes

INTRODUCTION

Diabetic retinopathy is already present in many cases of newly diagnosed type 2 diabetics.¹ It is one of the most common and serious complications of type 2 diabetes mellitus (T2DM) and a leading cause of blindness not only in Pakistan but also worldwide.² The prevalence of diabetic retinopathy at the time of diagnosis varies from 5–35%.³ The study was done in southern Pakistan which showed 15% of newly diagnosed diabetics had retinopathy at the time of diagnosis.⁴ Diabetic retinopathy is a highly specific vascular complication of both type 1 and type 2 diabetes. The prevalence of retinopathy is strongly related to the duration of diabetes. After 20 years of diabetes, nearly all patients with type 1 diabetics and more than 60% of patients with type 2 diabetics have some degree of retinopathy. Diabetic retinopathy poses a serious threat to vision. With increasing age, risk of diabetic retinopathy increases. This was proved by a study which showed that frequency of retinopathy was significantly higher in diabetic patients who are older than 50 years compared to those who are 30–49 years old.⁵ In a comparative study the prevalence of diabetic retinopathy between hospital and community based screening and between paying and non-paying patients was 21.05%, 24.39% and 23.80% respectively.⁶

In general, the progression of retinopathy is from mild non-proliferative abnormalities characterised by increased vascular permeability, to moderate and severe non-proliferative diabetic retinopathy characterised by vascular closure, to proliferative diabetic retinopathy characterised by growth of new

blood vessels on the retina and posterior surface of the vitreous. Pregnancy, puberty, and cataract surgery can accelerate these changes. Blindness due to diabetic retinopathy results from several mechanisms. Central vision may be impaired by macular oedema or capillary non perfusion, the new blood vessels of proliferative diabetic retinopathy and contraction of the accompanying fibrous tissue can distort the retina and lead to tractional retinal detachment producing severe and often irreversible vision loss. The new blood vessels may bleed adding further to the complications of pre retinal or vitreous haemorrhage, this serious complication has been reported in patients with T2DM as mentioned in the ADVANCE study (Action in Diabetes and Vascular Disease) from 39 centres in 14 countries in Asia, Australia, Europe and North America.

The baseline retinopathy level of these patients with type 2 diabetes was 40.1%.⁷ It was observed that most of these patients had not controlled their blood sugars and hardly ever visited their ophthalmologist. A study showed that only 4% of these patients had optimum diabetic control with HbA1C of less than 7 and only 47% had history of previous eye examinations.⁸ So in this study we decided to see the frequency of diabetic retinopathy in patients after diagnosis for ten years with type 2 diabetes mellitus.

PATIENTS AND METHODS

The prospective and analytical study was conducted at Liaquat University of Medical Health Sciences Jamshoro, Pakistan from January 2008 to January 2010. The study group comprised of 200 patients of T2DM attending the medical clinic. All patients who were

diagnosed as T2DM of ten years duration were included in the study. Special case sheets were arranged, containing detailed history and retinal examination after fully dilating the pupil. And detailed fundoscopic examination was done. Retinopathy was graded into background, pre-proliferative and proliferative retinopathy. Patients with hypertension, retinal artery occlusion, retinal vasculitis and sickle cell retinopathy were excluded from study. Type-2 diabetes was diagnosed using the WHO criteria.⁹ Statistical analysis was carried out using the SPSS-11.

RESULTS

Over a period of twelve months 200 patients were enrolled in the study. Age range was 38–70 years; 110 (55%) patients were males and 90 (45%) patients were females. The mean age of patient at the time of diagnosis was 49 years (Males 47±1.83, Females 46±3.70 years). Diabetic type 2 patients were found to have 51 (25.5%) diabetic retinopathy after ten years of diagnosis; among them 30 patients were males and 21 patients were females. Thirty-one (15.5%) were diagnosed as having background retinopathy, 12 (6%) were suffering from pre proliferative retinopathy and 8 (4%) of patients were having proliferative retinopathy. (Table-1)

Table-1: Frequency of diabetic retinopathy in patients after ten years of diagnosis of type 2 diabetes mellitus (n=200)

Type	Cases	Percentage
Background retinopathy	31	15.5
Preproliferative retinopathy	12	6.0
Proliferative retinopathy	8	4.0
Total cases	51	25.5

DISCUSSION

Diabetic retinopathy is estimated to be the most frequent cause of new cases of blindness among adults aged 20–74 years.¹⁰ The risk of micro-vascular complications and glycaemia have linear relationship as proved by United Kingdom Prospective Diabetes Study UKPDS data such that for every percentage point decrease in HbA_{1C} there was a 35% reduction in the risk of micro-vascular complications. The situation is worsening as proved in a study. The prevalence of type 1 and type 2 diabetes in the UK general population from 1996–2005 showed an increase from 2.8% in 1996 to 4.3% in 2005.¹¹ Intensive treatment of diabetes definitely improves the situation as reported from the Action to Control Cardiovascular Risk in Diabetes Accord Eye study that at 4 years, the rates of progression of diabetic retinopathy were 7.3% with intensive glycaemia treatment, versus 10.4% with standard therapy.¹² It has been studied that prevalence of T2DM in Gaddap Town was 8.73%, diabetic retinopathy was seen in

27.43% of the diabetic cases with 7.51% patients requiring urgent intervention for vision threatening complications.¹³ Results are comparable to our study which showed percentage of diabetic retinopathy was 25.5% and 4% had proliferative retinopathy. A positive relationship between incidence and progression of retinopathy and glycosylated haemoglobin remained after controlling for duration of diabetes, age, sex, and baseline retinopathy. These data suggest a strong and consistent relationship between hyperglycaemia and incidence and progression of the disease.¹⁴

Computers have long been proposed to assist the grading process. The systems developed have used varied feature recognition techniques to identify and quantify retinopathy automatically. The sensitivity and specificity of each of these technologies meet the criteria required by the National Institute for Clinical Excellence (NICE) guidelines for clinicians.¹⁵ Computer systems have been proposed and developed by a number of groups to assist or replace the grader. An automated grading process may be more cost effective in the long term.¹⁶

In men with Type 2 diabetes, there is a strong association between retinopathy and obstructive sleep apnoea.¹⁷ Patients with longer duration of diabetes mellitus had a higher incidence of diabetic retinopathy and macular edema.¹⁸ The 10-year incidence of retinopathy, progression of retinopathy, and progression to proliferative retinopathy were highest in the group diagnosed before age 30 years, intermediate in the insulin-taking group diagnosed at age 30 years or older, and lowest in the non-insulin taking group, respectively.¹⁹ After ten years of diabetes, severity of retinopathy was related to longer duration, high levels of glycosylated haemoglobin, presence of proteinuria, higher diastolic BP, and male sex.²⁰

It has been studied that Ischemic diabetic retinopathy protected against nuclear sclerotic cataract.²¹ In a population-based cross-sectional study, there was no evidence of an association between the metabolic syndrome and retinopathy independent of diabetes status. Prospective studies are warranted to determine the significance of the metabolic syndrome for predicting risk of ocular and systemic disease independent of diabetes.²² In theory, Vitamins C and E and magnesium could help prevent or limit diabetic retinopathy. For example, in animal models Vitamins C and E suppress production of a growth factor, which can promote abnormal blood vessels in the retina. And high dietary levels of magnesium are associated with lower blood pressure and blood sugar, both of which correlate with lower risk of retinopathy.²³ Patients with type 2 diabetes should have an initial dilated and comprehensive eye

examination by an ophthalmologist or optometrist shortly after the diagnosis of diabetes is made. In 2002, the National Institute of Clinical Excellence²⁴ recommended the eyes of people with type 2 diabetes are screened at the time of diagnosis and at least annually thereafter, and subsequent guidelines retained this recommendation.²⁵

CONCLUSION

Type 2 diabetic patients should be screened as early as possible to prevent from visual loss by timely management of diabetic retinopathy as diabetes is one of most common cause of blindness in the world.

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