

**MEASUREMENT OF PREVALENCE OF DIABETIC RETINOPATHY IN PATIENTS
SUFFERING FROM DIABETES**

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Abstract:

Objective: The main objective of this study is to check the burden of Diabetic Retinopathy in population who is suffering from Diabetes Mellitus.

Materials & Methods: Out of the 400 patients, 310 patients were included in the study after the scrutinizing the patients specially those who were not fulfilling the inclusion criteria. Study participants were selected using Non-Probability consecutive sampling technique, which involved selecting every consecutive patient who met the inclusion criteria. Both Male and Females patients participated in this Study. The data for the study was collected from the patients by using a proforma, who were having Diabetes Mellitus from last 10 years and were using Oral Anti-Diabetic or insulin to control Sugar.

Results: Demographic data and Medical details of 310 patients were included. From these patients. The age of Patients were in Between 45-75 years. Total Females in study were 145(46.77%) . Remaining were Male Patients 165(53.22%). .Out of these 310 patients, About 120 (38.70%) developed Diabetic Retinopathy because of having poor control of Blood glucose level. From these 120 positive patients, 60 (50%) developed mild NPDR, 20 (16.66%) patients suffered from Moderate NPDR , About 10(8.3%) patients got severe disease. While the fundus of 30(25%) patients showed PDR.

Conclusion: Burden of Diabetic Retinopathy is increasing day by day due to rapidly increase in prevalence of Diabetes Mellitus. This is serious condition causing the visual deterioration over period of time. Control of Diabetes is necessary to minimize its effects on Retina.

Keywords: Diabetic Retinopathy, Diabetes, DR,

Introduction: Recent estimates suggest that the global number of individuals affected by diabetes is projected to increase substantially from 173 million in 2001 to an alarming 365 million by the year 2030(1). This trend holds true for both type 1 Diabetes mellitus also abbreviated as T1D and type 2 Diabetes Mellitus set s D2M), both of which are significantly influenced by a person's race/ethnicity(2). One crucial marker that is widely used to assess diabetic care quality and predict the risk of diabetic complications is hemoglobin A1c (HbA1c).

HbA1c is a reliable indicator of average blood glucose levels over an extended period(3). This crucial measure plays an essential role in evaluating the effectiveness of diabetes treatment plans, making timely adjustments, and reducing the risk of long-term complications. Among the various microvascular complications of diabetes, diabetic retinopathy (DR) is one of the most prevalent, and its incidence continues to grow in the developed world(4). DR results from chronic exposure to metabolic alterations induced by diabetes that damage the retina's microvasculature. The long-term consequences of DR can be severe and may lead to legal blindness and severely deteriorate the visual acuity in diabetic population(5).

Literature Review

Nonproliferative DR is a less severe form of the disease, which manifests as micro aneurysms, superficial and deep retinal hemorrhages, hard exudates, and macular edema(6). Proliferative DR, on the other hand, is a more severe form of the condition characterized by the development of new blood vessels in the retina, which may ultimately lead to scarring and vitreous damage(7). The diagnosis of DR is usually established using a combination of clinical techniques, such as ophthalmoscopy, optical coherence tomography, retinal photography, and fluorescein angiography(8). Early detection, prompt intervention, and effective management of DR are critical for preserving vision and reducing the risk of long-term complications in diabetic patients(9)

Several factors have been identified that contribute to the development and progression of diabetic retinopathy(10). These include the type and duration of diabetes mellitus, age, gender, glycemic control, hypertension, body mass index, smoking, serum lipids, and the presence of microalbuminuria(11, 12). For example, people with type 1 diabetes are at higher risk of developing diabetic retinopathy than those with type 2 diabetes(13). Similarly, people with poor blood sugar control, high blood pressure, and high cholesterol are more likely to develop diabetic retinopathy(14).

As the burden of Diabetes is increasing in Asian world socially in Pakistan, so the complications associated with Diabetes are also increasing which includes Diabetic Retinopathy, Diabetic Nephropathy and Diabetic Angioplasty etc. These complications make life of Diabetic patients miserable. Many studies have done which represents the risk factors, treatment and prevention of complications occurred by Diabetes. However this is the study which emphasizes on the importance of Prevalence of disease. It measures that how much burden of Diabetic Retinopathy

is present in Population because without knowing this one cannot understand the importance of management of Diabetic Retinopathy.

Materials & Methods:

2.1 The study was done in IBN-e-Siena Hospital to evaluate the Presence of Diabetic Retinopathy in Diabetic Patients irrespective whether they were suffering from Type 1 Diabetes or having Type 2 Diabetes. A total of 400 diabetic patients were included in the study, and their medical records were reviewed to collect data.

2.2 Out of the 400 patients, 310 patients were included in the study after applying inclusion and exclusion criteria. Patients with gestational diabetes were ruled out from this study. The inclusion criteria required patients to have baseline information and no history of hypertension at baseline. Study participants were selected using Non-Probability consecutive sampling technique, which involved selecting every consecutive patient who met the inclusion criteria.

2.3 Both Male and Female patients participated in this Study. The data for the study was extracted from the medical records of the patients who were having Diabetes Mellitus from last 10 years and were using Oral Anti-Diabetic or insulin to control Sugar. The extracted data was then cleaned, coded, categorized, merged, and analyzed using statistical Package of Social Sciences SPSS version 22. This analysis helped to determine the relative importance of each predictor variable in explaining the occurrence of diabetic retinopathy.

Results: In this study, Demographic data and Medical details of 310 patients were included. The age of Patients were in Between 45-75 years. Total Females in study were 145(46.77%) . Remaining were Male Patients 165(53.22%). Out of these 310 patients, 210 (67.74%) were taking oral hypoglycemic drugs to control the diabetes Mellitus while only 100 (32.25%) participants were using Insulin to control Diabetes.

From these patients, About 120 (38.70%) developed Diabetic Retinopathy because of having poor control of Blood glucose level.

Diabetic Retinopathy was divided into its two types. Proliferative Diabetic Retinopathy (PDR) and Non- Proliferative Diabetic Retinopathy(NPDR) .The Degree of Non Proliferative Diabetic Retinopathy was measured as mild, moderate and Severe. Mild cases were those who were having only soft/hard exudates and Mild Hemorrhage along with microaneurysm. Moderate= hard exudates+Hemorrhages in 1-3 quadrants. Severe= Hemorrhages in all four quadrants+ IRMA + venous Beading.

While PDR is considered as advanced diabetic Retinopathy with New vessels Formation on Disc (NVDs) and new vessel formation elsewhere (NVEs). From these 120 positive patients, 60 (50%) developed mild NPDR, 20 (16.66%) patients suffered from Moderate NPDR , About 10(8.3%) patients got severe disease. While the fundus of 30(25%) patients showed PDR.

Table 1: Demonstrating Demographic Details of patients

Sr. No	Parameter	Frequency	Percent
1	Age (years)	45-75	100%
2	Gender		
	Female	145	46.77%
	Male	165	53.22%
3	BMI (kg/m ²)	28.4-32.6	100%
4	Disease Patients		
	Diabetic Retinopathy	120	38.70%
	No Retinopathy	190	61.30%
5.	Control of Diabetes		
	Oral hypoglycemic	210	67.74%
	Insulin	100	32.25%

GRAPH 1: SHOWING DISEASED & NON-DISEASED PATIENTS

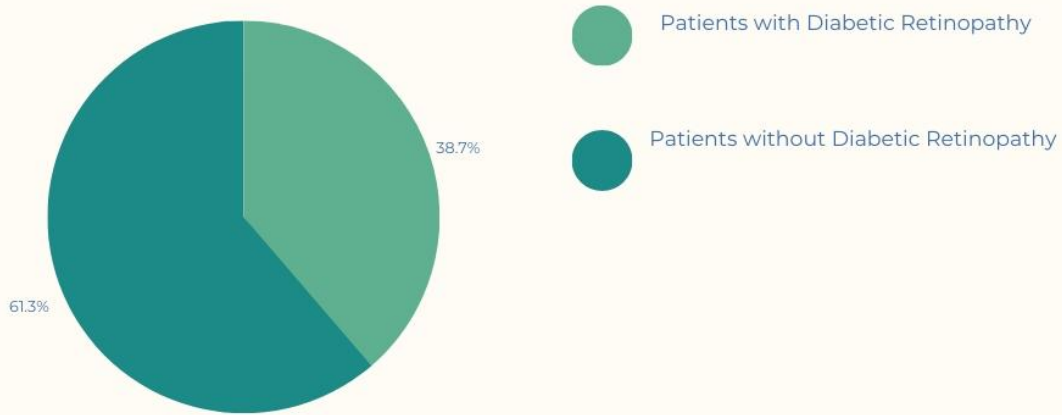


Table 2: showing Degree of Diabetic Retinopathy

Sr.No	Degree	Diabetic Retinopathy (n=120)	Percent
1.	Mild NPDR	60	50%
2.	Moderate NPDR	20	16.66%
3.	Severe NPDR	10	8.3%
4.	PDR	30	25%

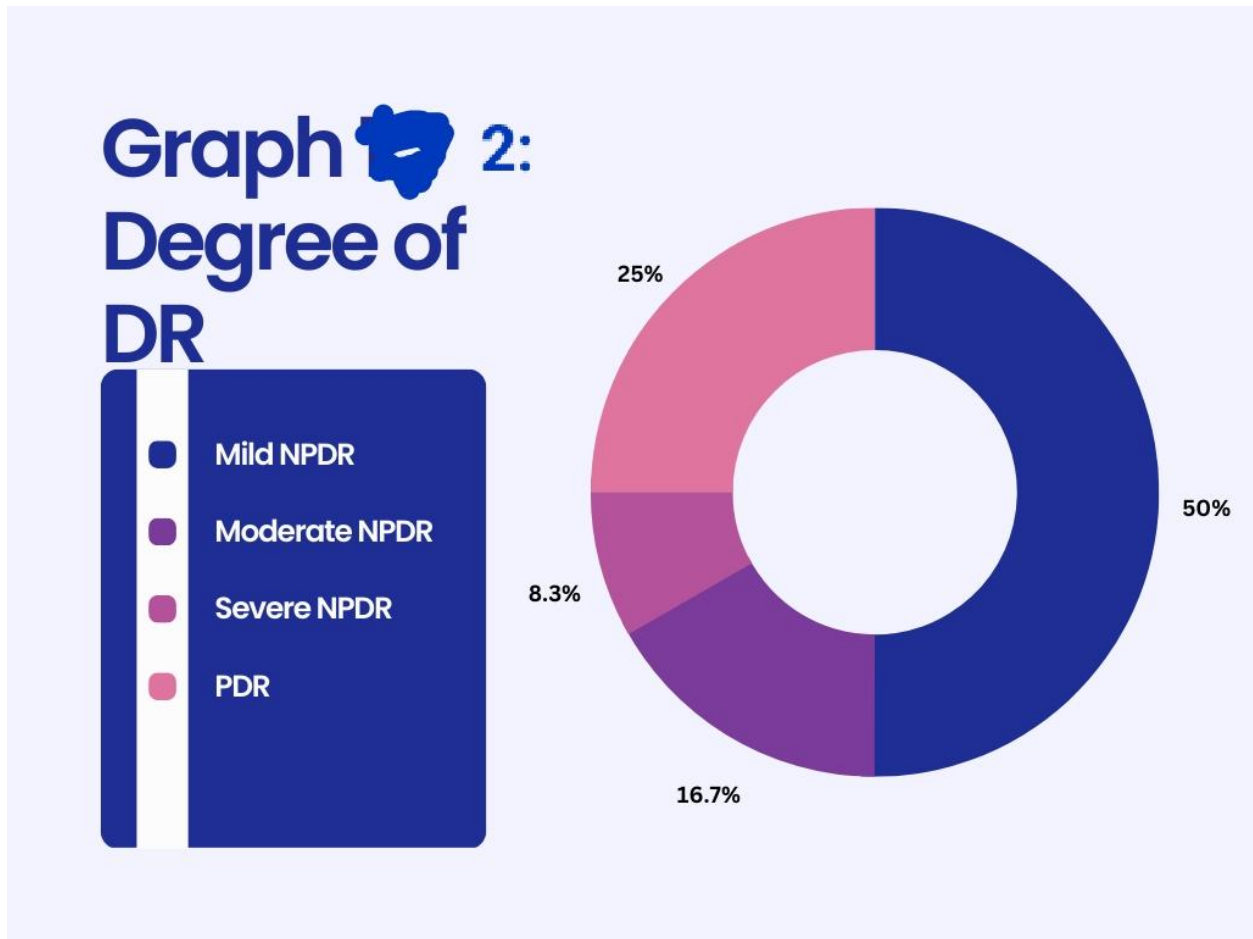


Table 1 showed the demographic details of Patients along their BMI, Gender and about prevalence of Diabetic Retinopathy. Graph 1 is visual illustration of these details. Table 2 is indicating Degree of Diabetic Retinopathy in 120 DR patients while Graph 2 is visual illustration of them .

Discussion:

Diabetic retinopathy is a leading cause of blindness in adults with diabetes(15). The condition is characterized by damage to the blood vessels in the retina, which can lead to vision loss if left untreated. Early detection of diabetic retinopathy is essential to prevent severe visual loss(16). Regular eye exams are important for people with diabetes, particularly those with a long history of the disease or poor blood sugar control(17). In this study male to female ratio affected from Diabetic Retinopathy was almost same except Male population contributing in this regard was little bit higher. Females affected were 46.77% and males affected were about 53.22%.

Body mass index of majority patients was higher as Obesity has strong relationship with Type 2 Diabetes Mellitus. In Type 2 DM, Level of Concentra of insulin is with inthe normal range but patient's glucose level remains high because insulin can not find its targeting tissue because adipose tissues are masking the target cells(18). From the total 310 diabetic patients ,About 210 (67.74%) were taking oral hypoglycemic drugs to control the diabetes Mellitus while only 100 (32.25%) participants were using Insulin to control Diabetes. Oral Hypoglycemic drug Metformin is widely used to minimize the blood sugar level also because of its multiple advantages. This Metformin not only lower the sugar levels in blood but also helpful in weight reduction thus idealizing this drug to control type 2 Diabetes Mellitus(19)

Diabetic Retinopathy was seen more in those patients who were injecting insulin to maintain their sugar levels in blood, as all these patients were not having good control of sugar by using oral Anti-diabetic medication . Because of this uncontrolled Glycaemia, blood sugar affected their retina thus impairing visual acuity as seen in this study that almost 25% patients experienced Proliferative Diabetic Retinopathy needing Laser photocoagulation

Several factors have been identified that contribute to the development and progression of diabetic retinopathy(20, 21).

Regular eye exams are critical for people with diabetes, particularly those with a long history of the disease or poor blood sugar control(22). Eye exams should be conducted at least once a year, and more frequently if there are signs of diabetic retinopathy or other eye problems(23). During an eye exam, an ophthalmologist or optometrist will examine the retina for signs of damage. If diabetic retinopathy is detected, laser photocoagulation may be recommended(24). This procedure uses a laser to seal off leaky blood vessels in the retina, which can help prevent further damage and vision loss(25).

In addition to regular eye exams, people with diabetes can take steps to reduce their risk of developing diabetic retinopathy. This includes maintaining good blood sugar control, keeping blood pressure and cholesterol levels within a healthy range, quitting smoking, and maintaining a healthy body weight(26). Managing diabetes is a lifelong process, and it is important to work closely with a healthcare provider to develop a comprehensive treatment plan that includes regular eye exams and other preventive measures (27). Intravitreal injection s are now commonly used to treat Diabetic Retinopathy. IVI is a valuable tool in the management of diabetic retinopathy and can help to prevent vision loss and improve visual acuity in patients with this condition. IVI is often repeated at regular intervals to maintain the effectiveness of the treatment. The frequency of injections varies depending on the severity of the diabetic retinopathy and the response to the medication. In some cases, IVI may be combined with other treatments, such as laser therapy, to further improve the outcome.(28) In Patients who develop Proliferative Diabetic Retinopathy they usually need Laser photocoagulation. Laser photocoagulation is a proven treatment method for preventing further vision loss and preserving visual acuity in patients with diabetic retinopathy. The procedure involves using a laser to create small burns in the retina,

which causes the damaged blood vessels to seal off, preventing further leakage of blood and fluid into the retina. This reduces swelling and stabilizes the retina, preventing further damage to the retinal cells(29). Diabetic Retinopathy burden should be reduced in diabetic patients by controlling Diabetes Mellitus.

Conclusion: Burden of Diabetic Retinopathy is increasing day by day due to rapidly increase in prevalence of Diabetes Mellitus. Diabetic retinopathy is a condition that affects the eyes of people with diabetes, causing damage to the blood vessels in the retina. This is serious condition causing the visual deterioration over period of time. Control of Diabetes is necessary to minimize its effects on Retina. Keeping blood sugar levels within a healthy range is crucial to preventing diabetic retinopathy. High blood sugar levels can damage the blood vessels in the retina, causing them to leak or bleed.

Conflict of Interest: In this whole study, Author did not find any conflict of interest

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