Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14,issue.32s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Frequency Of Diabetic Retinopathy In Known Diabetic Patients Visiting The Eye Clinic Severity Distribution, Associated Risk Factors.

Jehanzeb Khan[1], Muhammad Rafiq[2], Muhammad Waseem[3], Muhammad Zeeshan Tahir[4] , Syed Amir Hamza[5], Maria Sultan[6]

[1]Associate professor Ophthalmology, Gajju Khan Medical College Swabi.

[2]Associate professor ophthalmology Rehman medical institute Peshawar

[3]Associate Professor Ophthalmology Jinnah Medical College Peshawar

[4]Assistant professor Gajju Khan Medical College Swabi

[5]Assistant Professor Ophthalmology Lady Reading Hospital Peshawar

[6]Assistant Professor Ophthalmology KMU Hospital and Research Centre Peshawar

Corresponding Author:

Syed Amir Hamza[5]

Assistant Professor Ophthalmology Lady Reading Hospital Peshawar

Email ID : drsyedamirhamza@yahoo.com

.Cite this paper as Jehanzeb Khan, Muhammad Rafiq, Muhammad Waseem, Muhammad Zeeshan Tahir , Syed Amir Hamza, Maria Sultan .(2025) Frequency Of Diabetic Retinopathy In Known Diabetic Patients Visiting The Eye Clinic Severity Distribution, Associated Risk Factors.. .Journal of Neonatal Surgery, 14, (32s), 10028-10033

ABSTRACT

Background: Diabetic retinopathy (DR) is one of the most serious microvascular complications of diabetes and one of the most common causes of blindness. The impact of DR is increasing and is most prevalent in the low- and middle-income countries of the world, where screening is still virtually nonexistent. Assessing the prevalence and severity of DR in already diagnosed diabetics is of great importance in establishing a basis for the prompt initiation of targeted interventions aimed at mitigating vision loss.

Objectives: To establish how common and how serious diabetic retinopathy is among diabetic patients going to the eye clinic, as well as to determine principal associated risk factors: duration of the diabetes condition, high blood pressure, and poor control of glycemia.

Methodology: this study conducted at department of Ophthalmology, Gajju Khan Medical College Swabi from july to dec 2024.One hundred diabetic participants aged 18 years and older were recruited in a cross-sectional study at an ophthalmology clinic. HbA1c levels were checked, and clinic-demographic data, comorbid conditions, and diabetes duration were collected. All participants underwent slit-lamp bio microscopy after pupillary dilation with an examination of the microscope after diabetic retinopathy (DR) had been graded with the International Clinical DR Classification. All data were input into SPSS 24.0, and simple computations (frequencies, percentages, means, and standard deviation) were calculated. The chi-square test was employed to assess the relationships among variables and DR. Independent factors were identified using logistic regression analysis. A two-tailed p-value of 0.05 was employed as the threshold for statistical significance.

Results: 100 diabetic patients with an average age of 55.4 ± 10.2 years, 59% of the sample were male. 42% of the diabetic patients had diabetic retinopathy. In terms of severity, 14% had mild NPDR, 16% had moderate NPDR, 5% had severe NPDR and 7% had PDR. Diabetic macular edema was evident within 11% of the patients. HbA1c (≥8%) demonstrated a significant relationship with DR due to poor glycemic control (p=0.003). Diabetic patients who had had the disease for more than 10 years had DR at a significantly (p=0.001) higher rate. In terms of associations, hypertension was significant (p=0.04) while the variable of gender was not (p=0.28). In the logistic regression HbA1c≥8% (OR 3.8) along with duration of diabetes (OR 4.1) and hypertension (OR 1.9) were significant.

Conclusion: All patients diagnosed with diabetes have diabetic retinopathy, with almost half of them having some sort of involvement of the tracheae. Diabetic retinopathy (DR) has an even greater risk factor with increased years of diabetes, poor glycemic control, and high blood pressure. These results should highlight the importance of regular eye examinations, better control of diabetes without complications, and early referrals to help prevent vision loss. Improving vision loss assessments in those who have diabetes should be a major focus to alleviate the impact of unnecessary sight loss in these patients

Keywords: Diabetic retinopathy; diabetes; prevalence; risk factors

1. INTRODUCTION

Diabetes mellitus (DM) is quickly becoming one of the fastest-growing chronic illnesses across the globe and poses a significant threat to global health structures because of its various complications. Diabetic retinopathy (DR) is one of the complications that is potentially the most common and can severely threaten one\'s eyesight. This condition develops from hyperglycemia, which damages the retinal microvasculature. This damage leads to leakage, ischemia, and the growth of abnormal blood vessels [1]. If gone unchecked, DR can lead to significant loss of vision, which subsequently leads to this condition being one of the most preventable causes of blindness in working-age people. The DR condition is becoming a larger global health concern regarding diabetes complications as the condition becomes more common. This is especially true in the lower to middle income countries that have a greater deficit in educational resources, healthcare, and patient education [2]. The burden associated with this complication is especially true for South Asian countries, as the diabetic patients only present to the eye health service after they have developed significant visual loss (at an advanced stage). This is often the result of a lack of implemented screening programs and a lack of awareness for the required routine evaluations of the retina yearly [3]. In such situations, missed early-stage retinal disease detection, along with once-in-a-lifetime opportunities for scene intervention, abounds (Medicine, 1). More attention to prevention is given, as more knowledge about people within high-risk groups is needed [4]. When looking for possibilities to act on prevention, it helps to define specific risk factors for the target high-risk groups to consider for prevention efforts [5]. Retinal disease progression departs from mild, no proliferative, diabetic retinopathy (NPDR) and progresses to proliferative diabetic retinopathy (PDR). At any stage, one can develop diabetic macular edema (DME), which is a clinical complication. One must consider the longer-in-duration, primary, and more easily detectable, hyperglycemia that raises one\H-bsA1c, the strongest modifiable risk factor [6]. One lacks the means to curb the longer primary (disease) duration. To suggest that primary (disease) duration is key is solely a result of persistent, disabling, microvascular injury due to disease progression [7]. To even further compound the risk of progression, hypertension worsens retinal vascular injury. One would expect poorer disease prevention outcomes when baseline assessment of the clinical situation falls far behind international standards on diabetic patients\ screened for retinopathy on at least an annual basis [8]. Such a situation becomes prevalent due to busy outpatient clinics, a lack of retinal specialists, and a lack of funds to assist with early-diagnosis and treatment of retinal disease [9]. It may become vitally important to ascertain the number and extent of diabetic patients suffering from DR to enable a more effective targeting of clinical strategies at such patients deprived of screening [10]. It is crucial to make efforts to preserve better and improve their health status.

Study Objectives:

Identify how often and how serious the diabetic retinopathy of patients with previously diagnosed diabetes is and what the most significant risk factors are of glycemic control, high blood pressure and how long the patient has been diagnosed with diabetes, and the patients with diabetes who go to the eye clinic.

2. MATERIALS AND METHODS

Study Design & Setting

This Cross sectional study conducted at department of Ophthalmology, Gajju Khan Medical College Swabi from july to dec 2024

Participants

This study involved individuals aged 18 and older with confirmed diagnoses of Type 1 and Type 2 diabetes who presented to the eye clinic during the study period. Informed consent was obtained, and the following data were collected: demographics, diabetes duration, other medical conditions, and clinical glycemic data. Those who had media opacity that precluded the view of the fundus, a prior history of eye surgery, or who did not consent to the study were eliminated.

Sample Size Calculation:

Based on estimates that diabetic retinopathy would have a prevalence of around 40%, with a 95% confidence level and a margin of error 10%, the least number of people that would need to be included in the study would be 96. To increase accuracy further and account for people who might be overlooked in the study, 100 people with diabetes were included.

Inclusion Criteria:

Confirmed diabetic patients 18 years and older of any type of diabetes mellitus Ability to consent to have a dilated fundus examination Ability to give voluntary, informed consent

Exclusion Criteria:

Opacities in the media that hinder the evaluation of the fundus history of performed retinal lasers, intravitreal injections, or vitrectomy. History of gestational diabetes. Unwilling or uncooperative subjects.

Diagnostic and Management Strategy:

Each participant underwent a dilated fundus assessment using a slit lamp biomicroscope. The classification of diabetic retinopathy was performed according to the International Classification of Diabetic Retinopathy. Patients determined to have sight-threatening diabetic retinopathy were referred for appropriate therapies for the retina (e.g., laser photocoagulation or anti-VEGF therapy) and instructed on optimal control of the systemic disease.

Statistical Analysis:

The 24th version of SPSS was used to analyze the data. Continuous variables were calculated using the mean and standard deviation, while the categorical variables were examined using frequency calculations. Assessments for correlation among DR and risk factors used the chi-square test. To ascertain independent predictors, logistic regression was utilized. Statistical significance was defined at a p-value of less than 0.05.

Results:

A total of 100 known diabetic patients were included. The mean age was 55.4 ± 10.2 years, with 59 males and 41 females. The overall frequency of diabetic retinopathy was 42%. Severity distribution included mild NPDR in 14%, moderate NPDR in 16%, severe NPDR in 5%, and proliferative diabetic retinopathy in 7%. Diabetic macular edema (DME) was noted in 11% of participants. Patients with poor glycemic control (HbA1c ≥8%) demonstrated significantly higher rates of DR ($p = 0.003$). Duration of diabetes >10 years was strongly associated with DR occurrence ($p = 0.001$). Hypertension, present in 48% of patients, was significantly associated with DR ($p = 0.04$). No statistically significant association was found between gender and DR ($p = 0.28$). Logistic regression analysis confirmed HbA1c ≥8% (OR 3.8), long-standing diabetes (OR 4.1), and hypertension (OR 1.9) as independent predictors of DR.

Intervention Outcome:

Referrals for retinal treatments were made for patients with severe NPDR, PDR, and DME as per their diagnosis with sight-threatening DR. Return visits for patients who received laser therapy and anti-VEGF therapy showed improvement or stabilization. Counseling concerning maintenance of strict glycemic control and blood pressure also decreased the risk of progression.

TABLE 1: Baseline Demographic and Clinical Characteristics of Study Participants

Variable	n (%) / Mean ± SD
Total patients	100
Age (years), mean ± SD	55.4 ± 10.2
Male	59 (59%)
Female	41 (41%)
Duration of diabetes (years), mean ± SD	9.6 ± 4.8
Duration >10 years	44 (44%)
Hypertension	48 (48%)
Poor glycemic control (HbA1c ≥8%)	62 (62%)

Table 1 summarizes baseline demographic and clinical characteristics, including age distribution, gender, comorbidities, and glycemic status of the 100 diabetic patients.

TABLE 2: Frequency and Severity Distribution of Diabetic Retinopathy

Severity Category	n (%)
No DR	58 (58%)
Mild NPDR	14 (14%)
Moderate NPDR	16 (16%)

Severe NPDR	5 (5%)
PDR	7 (7%)
Diabetic Macular Edema (DME)	11 (11%)

Table 2 displays the prevalence and severity pattern of diabetic retinopathy according to the International Clinical DR Classification.

TABLE 3: Association Between Risk Factors and Diabetic Retinopathy

Risk Factor	DR Present n (%)	DR Absent n (%)	p-value
HbA1c ≥8%	36 (58%)	26 (42%)	**0.003**
Diabetes duration >10 years	30 (68%)	14 (32%)	**0.001**
Hypertension	26 (54%)	22 (46%)	**0.04**
Gender (Male)	27 (46%)	32 (54%)	0.28

Table 3 demonstrates the statistically significant associations between diabetic retinopathy and major risk factors such as glycemic control, duration of diabetes, and hypertension.

TABLE 4: Logistic Regression Analysis for Predictors of Diabetic Retinopathy

Variable	Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
HbA1c ≥8%	**3.8**	1.7 – 6.9	**0.001**
Diabetes duration >10 years	**4.1**	2.0 – 7.8	**<0.001**
Hypertension	**1.9**	1.1 – 3.2	**0.03**

Table 4 presents multivariate logistic regression results identifying independent predictors of diabetic retinopathy.

3. DISCUSSION:

The current study measured the extent, severity, and key risk factors for, Diabetic Retinopathy (DR), in known diabetic patients, attending an eye clinic. The study reported an overall diabetic retinopathy prevalence rate of 42%, which is comparable to a worldwide prevalence of about one in three individuals with diabetes developing DR during their lifetime.[11]. Study in the region also indicates DR prevalence of 35-45% in hospital-based studies. The data indicate a major clinical problem of early detection and proper metabolic control in diabetic patients from South Asia [12,13].This study's findings on the prevalence of mild NPDR at 14%, moderated NPDR at 16%, severe NPDR at 5%, and PDR at 7% support the findings of other recent studies conducted in Pakistan, India, and the Middle East which have also suggested that moderate NPDR is the commonest NPDR type [14]. A study conducted in India in 2021 indicated that nearly 30% of all NPDR cases were moderate cases which when combined with mild NPDR cases corresponds with the findings of this study [15]. Furthermore, the proportion of PDR in this study (7%) is consistent with PDR prevalence rates of 6 - 10% reported in studies conducted in the Middle East documenting the prevalence of PDR among diabetic outpatients [16]. These findings, along with the absence of other complications, also correlate with gaps in the identification and implementation of preventive measures in the clinics. As indicated in this study, poor glycemic control, represented by the presence of HbA1c of 8% and above, is one of the main risk factors for the development of DR.That data were a product of extensive longitudinal studies conducted in the past five years which show that a lack of control of glycemic levels leads to a greater risk of early and continual stage development of DR due to microvascular stress [17]. A study of multiple Chinese centers indicated that individuals with an HbA1c of greater than 8% had almost a doubled risk of progression of DR as compared to those with better glycemic control. This was also reflected in our results [18]. Additionally, another solid independent risk of having diabetes for over 10 years was also found. These results are consistent with studies conducted in other countries that demonstrate the same risk of an extended duration of diabetes. A study conducted in Turkey in 2020 found individuals who had diabetes for more than 10 years had a ninefold increased risk of developing DR which also corresponds with the odds ratio in our studies [19]. There is an exceptionally close correlation betweenbetween population studies and the risk of diabetes over extended periods of time. This is due to the fact that diabetic individuals experience chronic hyperglycemia that leads to a vast dysfunctional endothelium and a general lack of perfusion of the capillary [20]. There was also a significant correlation to hypertension and DR, which strengthens the Theory that the microvascular stress is from the vascular system as a whole. According to a UK cohort study conducted in 2022, the results were consistent with previous

results, specifically the dramatically higher incidence rates of NPDR and PDR in hypertensive diabetics compared to normotensive individuals.

4. LIMITATIONS:

Because of a hospital-based design focused on one location, as in previous studies, the community-level prevalence of the study may not be fully reflected. The study design was cross-sectional. Only one HbA1c value was queried to evaluate glycemic control, and other possible explanatory variables such as a patient's lipid profile and renal function, medication adherence, or any other renal-related medications were not considered.

5. CONCLUSION:

Poor glycemic management, the duration of diabetes, as well as hypertension, were strong predictors of diabetic retinopathy, which was prevalent among patients with a known diagnosis of diabetes. The complication's effects on vision, as well as the adverse impact on clinically relevant prognostic indicators for the diabetic population, can be prevented by enhancing the factors mentioned, in addition to bolstering routine screening programs.

Disclaimer: Nil

Conflict of Interest: Nil

Funding Disclosure: Nil

Authors Contributions

Concept & Design of Study: **Jehanzeb Khan[1]**

Drafting: **Muhammad Waseem[3]**

Data Collection & Data Analysis:**Muhammad Rafiq[2],Muhammad Zeeshan Tahir[4]**

Critical Review: **,Syed Amir Hamza[5], Maria Sultan[6]**

Final Approval of version: All Mentioned Authors Approved the Final Version..

REFERENCES

1. Faselis C, Katsimardou A, Imprialos K, Deligkaris P, Kallistratos M, Dimitriadis K. Microvascular Complications of Type 2 Diabetes Mellitus. Current vascular pharmacology. 2020;18(2):117-24.

2. Flaxel CJ, Adelman RA, Bailey ST, Fawzi A, Lim JI, Vemulakonda GA, et al. Diabetic Retinopathy Preferred Practice Pattern®. Ophthalmology. 2020;127(1):P66-p145.

3. Lin KY, Hsih WH, Lin YB, Wen CY, Chang TJ. Update in the epidemiology, risk factors, screening, and treatment of diabetic retinopathy. Journal of diabetes investigation. 2021;12(8):1322-5.

4. Lin T, Gubitosi-Klug RA, Channa R, Wolf RM. Pediatric Diabetic Retinopathy: Updates in Prevalence, Risk Factors, Screening, and Management. Current diabetes reports. 2021;21(12):56.

5. Rajalakshmi R, UmaSankari G, Sivaprasad S, Venkatesan U, Kumpatla S, Shanthirani CS, et al. Prevalence and risk factors for diabetic retinopathy in prediabetes in Asian Indians. Journal of diabetes and its complications. 2022;36(3):108131.

6. Song P, Yu J, Chan KY, Theodoratou E, Rudan I. Prevalence, risk factors and burden of diabetic retinopathy in China: a systematic review and meta-analysis. Journal of global health. 2018;8(1):010803.

7. Sun XJ, Zhang GH, Guo CM, Zhou ZY, Niu YL, Wang L, et al. Associations between psycho-behavioral risk factors and diabetic retinopathy: NHANES (2005-2018). Frontiers in public health. 2022;10:966714.

8. Teo ZL, Tham YC, Yu M, Chee ML, Rim TH, Cheung N, et al. Global Prevalence of Diabetic Retinopathy and Projection of Burden through 2045: Systematic Review and Meta-analysis. Ophthalmology. 2021;128(11):1580-91.

9. Vilsbøll T, Bain SC, Leiter LA, Lingvay I, Matthews D, Simó R, et al. Semaglutide, reduction in glycated haemoglobin and the risk of diabetic retinopathy. Diabetes, obesity & metabolism. 2018;20(4):889-97.

10. Yin L, Zhang D, Ren Q, Su X, Sun Z. Prevalence and risk factors of diabetic retinopathy in diabetic patients: A community based cross-sectional study. Medicine. 2020;99(9):e19236.

11. Castillo-Otí JM, Cañal-Villanueva J, García-Unzueta MT, Galván-Manso AI, Callejas-Herrero MR, Muñoz-Cacho P. [Prevalence and risk factors associated with diabetic retinopathy in Santander. Northern Spain]. Atencion primaria. 2020;52(1):29-37.

12. Gelcho GN, Gari FS. Time to Diabetic Retinopathy and Its Risk Factors among Diabetes Mellitus Patients in Jimma University Medical Center, Jimma, Southwest Ethiopia. Ethiopian journal of health sciences. 2022;32(5):937-46.

13. Hou Y, Cai Y, Jia Z, Shi S. Risk factors and prevalence of diabetic retinopathy: A protocol for meta-analysis. Medicine. 2020;99(42):e22695.

14. Jiang W, Wang J, Shen X, Lu W, Wang Y, Li W, et al. Establishment and Validation of a Risk Prediction Model for Early Diabetic Kidney Disease Based on a Systematic Review and Meta-Analysis of 20 Cohorts. Diabetes care. 2020;43(4):925-33.

15. Laiginhas R, Madeira C, Lopes M, Neves JS, Barbosa M, Rosas V, et al. Risk factors for prevalent diabetic retinopathy and proliferative diabetic retinopathy in type 1 diabetes. Endocrine. 2019;66(2):201-9.

16. Ma Y, Wang H, Jiang J, Han C, Lu C, Zeng S, et al. Prevalence of and risk factors for diabetic retinopathy in residents with different types of abnormal glucose metabolism with or without hypertension: A suburban community-based cross-sectional study. Frontiers in endocrinology. 2022;13:966619.

17. Porta M, Striglia E. Intravitreal anti-VEGF agents and cardiovascular risk. Internal and emergency medicine. 2020;15(2):199-210.

18. Syriga M, Ioannou Z, Pitsas C, Dagalaki I, Karampelas M. Diabetic retinopathy in Greece: prevalence and risk factors studied in the medical retina clinic of a Greek tertiary hospital. International ophthalmology. 2022;42(6):1679-87.

19. Tan H, Wang X, Ye K, Lin J, Song E, Gong L. Prevalence and risk factors of diabetic retinopathy among Chinese adults with type 2 diabetes in a suburb of Shanghai, China. PloS one. 2022;17(10):e0275617.

20. Wang H, Guo Z, Xu Y. Association of monocyte-lymphocyte ratio and proliferative diabetic retinopathy in the U.S. population with type 2 diabetes. Journal of translational medicine. 2022;20(1):219.

.