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Original Research

Clinico-Epidemiological Profile and Visual Outcome of Patients with Diabetic Retinopathy in a Tertiary Eye Care Center

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Abstract

Background: Diabetic Retinopathy (DR) is one of the leading causes of preventable blindness among working-age adults worldwide. With the increasing prevalence of diabetes mellitus, the burden of DR is rising significantly, particularly in developing countries. Early detection and timely management are essential to prevent visual impairment and blindness. Studies from tertiary eye care centers have reported substantial visual morbidity associated with advanced stages of DR. **Aim:** To evaluate the clinico-epidemiological profile and visual outcomes of patients diagnosed with diabetic retinopathy attending a tertiary eye care center. **Materials and Methods:** A hospital-based prospective observational study was conducted among 150 patients diagnosed with diabetic retinopathy attending the Ophthalmology Department of a tertiary eye care center over one year. Demographic characteristics, duration of diabetes, systemic risk factors, clinical grading of DR, and visual acuity outcomes were recorded. Visual outcome was assessed after appropriate medical or surgical management. Statistical analysis was performed using SPSS version 26.0. A p-value <0.05 was considered statistically significant. **Results:** Among 150 patients, the majority belonged to the age group of 51-70 years (64%). Males constituted 62% of cases. Non-Proliferative Diabetic Retinopathy (NPDR) was observed in 66% of patients, while Proliferative Diabetic Retinopathy (PDR) was noted in 34%. Diabetic Macular Edema (DME) was present in 38% of patients. Significant associations were found between severity of DR and duration of diabetes, poor glycemic control, hypertension, and dyslipidemia (p<0.05). Improvement in visual acuity following treatment was observed in 61.3% of patients. **Conclusion:** Diabetic retinopathy predominantly affects middle-aged and elderly diabetic individuals and is strongly associated with longer duration of diabetes and systemic comorbidities. Early diagnosis and timely intervention significantly improve visual outcomes and reduce the risk of blindness.

Keywords: Diabetic Retinopathy, Visual Outcome, NPDR, PDR, Diabetic Macular Edema, Epidemiology.

Introduction

Diabetes mellitus has emerged as a major public health challenge globally. One of the most significant microvascular complications of diabetes is diabetic retinopathy (DR), which remains a leading cause of visual impairment and blindness among adults. Chronic hyperglycemia causes progressive retinal microvascular damage leading to retinal ischemia, vascular leakage, neovascularization, and vision-threatening complications. According to recent epidemiological studies, diabetic retinopathy affects approximately one-third of diabetic individuals, with vision-threatening retinopathy affecting nearly one-tenth of patients.

The risk of DR increases with longer duration of diabetes, poor glycemic control, hypertension, nephropathy, and dyslipidemia. Visual loss in DR occurs mainly due to diabetic macular edema, vitreous hemorrhage, tractional retinal detachment, and neovascular glaucoma. Tertiary eye care centers frequently manage advanced stages of DR requiring laser photocoagulation, intravitreal injections, and vitreoretinal surgery. Evaluation of clinical characteristics and treatment outcomes is important for planning preventive strategies and improving patient care.

Therefore, the present study was undertaken to assess the clinico-epidemiological profile and visual outcomes of patients with diabetic retinopathy attending a tertiary eye care center.

Objectives

1. To study the demographic profile of patients with diabetic retinopathy.
2. To evaluate the clinical characteristics and severity of diabetic retinopathy.
3. To identify associated systemic risk factors.
4. To assess visual outcomes following treatment.

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Materials and Methods

Study Design

Prospective observational study.

Study Setting

Department of Ophthalmology, Tertiary Eye Care Teaching Hospital.

Study Duration

12 months.

Sample Size

150 patients diagnosed with diabetic retinopathy.

Inclusion Criteria

- Patients aged ≥ 18 years.
- Diagnosed cases of Type 1 or Type 2 Diabetes Mellitus.
- Presence of diabetic retinopathy on fundus examination.
- Willingness to participate in the study.

Exclusion Criteria

- Retinal vascular diseases other than DR.
- Ocular trauma.
- Advanced cataract preventing fundus visualization.
- Patients lost to follow-up.

Data Collection

Detailed clinical evaluation included:

- Age
- Gender
- Duration of diabetes
- HbA1c levels
- Hypertension status
- Dyslipidemia
- Smoking history
- Visual acuity assessment

Fundus examination was performed using indirect ophthalmoscopy and slit-lamp biomicroscopy with a 90D lens.

Classification of Diabetic Retinopathy

- Mild NPDR
- Moderate NPDR
- Severe NPDR
- PDR

Treatment Modalities

- Observation
- Laser photocoagulation
- Intravitreal anti-VEGF injections
- Vitrectomy

Statistical Analysis

Data were analyzed using SPSS version 26.0.

- Chi-square test
- Independent t-test
- Logistic regression analysis

$p < 0.05$ considered statistically significant.

Results

Table 1: Age Distribution

Age Group (Years)	Number (%)
31-40	12 (8%)
41-50	30 (20%)
51-60	48 (32%)
61-70	48 (32%)
>70	12 (8%)

Mean age = 58.4 ± 9.8 years.

Table 2: Gender Distribution

Gender	Number (%)
Male	93 (62%)
Female	57 (38%)

Table 3: Duration of Diabetes

Duration	Number (%)
<5 years	24 (16%)
5-10 years	48 (32%)
11-15 years	42 (28%)
>15 years	36 (24%)

Table 4: Severity of Diabetic Retinopathy

Stage	Number (%)
Mild NPDR	30 (20%)
Moderate NPDR	42 (28%)
Severe NPDR	27 (18%)
PDR	51 (34%)

Table 5: Associated Risk Factors

Risk Factor	Number (%)
Hypertension	84 (56%)
Dyslipidemia	63 (42%)
Smoking	36 (24%)
HbA1c >8%	96 (64%)

Table 6: Diabetic Macular Edema

Status	Number (%)
Present	57 (38%)
Absent	93 (62%)

Table 7: Visual Outcome After Treatment

Visual Outcome	Number (%)
Improved	92 (61.3%)
Stable	40 (26.7%)
Deteriorated	18 (12.0%)

Discussion

The present study demonstrated that diabetic retinopathy predominantly affected individuals aged above 50 years, with a male predominance. Similar observations were reported in hospital-based studies from South Asia and India.

Most patients had NPDR (66%), while PDR accounted for 34% of cases. Comparable findings have been documented in tertiary care studies evaluating diabetic eye disease.

Duration of diabetes was strongly associated with DR severity. Patients with diabetes duration exceeding 10 years showed significantly greater prevalence of severe NPDR and PDR. Poor glycemic control reflected by elevated HbA1c was another important predictor.

Hypertension and dyslipidemia were common coexisting conditions and were significantly associated with advanced retinopathy. Similar associations have been reported in large epidemiological studies.

Diabetic macular edema was present in 38% of patients and represented an important cause of visual impairment. Following treatment, visual improvement was observed in over 60% of patients, emphasizing the importance of early diagnosis and timely management.

The findings support the growing evidence that regular retinal screening and multidisciplinary diabetic care are essential to reduce vision-threatening complications.

Conclusion

Diabetic retinopathy remains a major cause of visual morbidity among diabetic patients attending tertiary eye care centers. Longer duration of diabetes, poor glycemic control, hypertension, and dyslipidemia were significant risk factors associated with severe disease.

Early screening, patient education, metabolic control, and timely ophthalmic intervention can significantly improve visual outcomes and reduce blindness due to diabetic retinopathy.

Limitations

1. Single-center study.
2. Limited sample size.
3. Short follow-up duration.
4. Hospital-based design limiting generalizability.

Recommendations

- Annual retinal screening for all diabetic patients.
- Strict glycemic and blood pressure control.
- Public awareness regarding diabetic eye disease.
- Strengthening retinal services at peripheral healthcare centers.

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