

**PREVALENCE OF DIABETIC RETINOPATHY AT FIVE YEARS OF UNCONTROLLED
TYPE II DIABETES IN JORDAN****Ahmad A. Al Husban*, MD Ahmed E. Khatatbeh, MD Mohammad A. Al Dalabih, MD Najed M. Al Quran, MD
Marwan M. Otoum, MD**

Alaa alhazaymeh, Optometrist Ayyat S. Alwadi, Optometrist Zaid H Alshlol, Optometrist.

***Corresponding Author: Ahmad A. Al Husban**

Alaa alhazaymeh, Optometrist Ayyat S. Alwadi, Optometrist Zaid H Alshlol, Optometrist.

Article Received on 28/03/2025

Article Revised on 18/04/2025

Article Published on 08/05/2025

ABSTRACT

Aim: This study explores the prevalence and severity of diabetic retinopathy (DR) among Jordanian patients with uncontrolled type 2 diabetes mellitus after five years of disease duration. **Methods:** A retrospective review was conducted at King Hussein Medical Center between January 2023 and January 2025. Medical records of patients with uncontrolled diabetes (HbA1c > 8.5%) were analyzed for demographic data, ocular findings, systemic comorbidities, and treatment modalities. The prevalence and stages of DR, including diabetic macular edema (DME), were recorded. **Results:** Among 200 patients (400 eyes) studied, DR was present in 65% of cases, with 36% having DME. The prevalence of DR increased with worsening glycemic control. Proliferative DR (PDR) was observed in 11% of cases, with hypertension, hyperlipidemia, and smoking being common risk factors. Treatment patterns showed that anti-VEGF therapy was the most frequently used intervention, particularly in DME (84.7%) and PDR (100%). **Conclusion:** The high prevalence of DR among Jordanian patients with uncontrolled diabetes highlights the need for early screening, improved glycemic control, and better public health strategies to prevent vision-threatening complications. Further researches are essential to explore the burden of diabetic eye disease in this population.

KEYWORDS: Diabetic retinopathy, Jordan, uncontrolled diabetes, HbA1c, diabetic macular edema, comorbidities.**INTRODUCTION**

Diabetes mellitus (DM) is a leading cause of blindness in adults, primarily due to ocular complications such as diabetic retinopathy (DR), diabetic macular edema (DME), cataracts, and glaucoma.^[1,2] Jordan faces a significant public health challenge, with a high prevalence of diabetes and associated ocular complications.^[2] Current data estimates that diabetes affects 15% to 20% of adults aged 25 and older in the country.^[2] This elevated prevalence is linked to genetic predisposition, lifestyles, poor dietary habits, and rising obesity rates.^[3,4] The condition imposes a burden on healthcare systems, alongside profound psychological and financial consequences for affected individuals.^[5]

Risk factors for diabetic retinopathy and its progression include prolonged duration of diabetes and inadequate glycemic control.^[6,7] Additional contributing factors include hypertension, hyperlipidemia, smoking, anemia, renal impairment, and pregnancy, all of which may exacerbate the severity of retinopathy and other complications.^[8]

Early detection and timely management of ocular

complications are essential for preventing irreversible vision loss, thereby enhancing the quality of life for patients and the quality of healthcare presented to the patients.^[9,10]

This study aims to assess the prevalence and types of ocular complications among patients with uncontrolled diabetes.

METHOD

This is a retrospective study conducted at the ophthalmology department of King Hussein medical Center between January 2023 and January 2025. The medical records of the patients who had uncontrolled type II DM of 5 years duration since the diagnosis of diabetes and with Hb A1c > 8.5 were reviewed regarding age, gender, past medical and surgical history and past ocular history. The results of the ocular examination were recorded including best corrected visual acuity, anterior segment examination and posterior segment examination. The rates and stages of diabetic retinopathy were identified, and the presence of maculopathy was recorded. The results of ocular imaging were reported as well. The obtained results were analyzed and compared

with other regional and global studies.

RESULTS

200 patients (400 eyes) aged between 46 and 68 years (mean 58.3 ± 6.3 years). (57.8%) were males. the mean HbA1c level was 10.2%.

This table summarizes clinical and demographic characteristics of 400 patients with diabetic retinopathy (DR) and related complications Diabetic retinopathy was found in 65.0% of patients. While DME was found in 36.0% of eyes.

Table 1: Clinical and Demographic Characteristics of The Patients With Diabetic Retinopathy (Dr) and Related Complications.

Pathology	Number	Percentages	Mean age	Male gender	% of males	HbA1c
No diabetic retinopathy	140	35.0%	58.3	81	57.8%	9.2
Mild NPDR	80	20.0%	59.6	46	57.5%	9.7
Moderate NPDR	72	18.0%	57.3	42	58.3%	9.8
Sever NPDR	64	16.0%	57.6	37	57.8%	11.5
DME	144	36.0%	57.4	84	58.3%	12.3
PDR	44	11.0%	58.6	25	56.8%	12.9

Among patients without diabetic retinopathy, hypertension was present in 15.7%, hyperlipidemia in 10.7%, smoking in 21.4%, and anemia in 1.4%, with no cases of renal impairment. As the severity of non-proliferative diabetic retinopathy (NPDR) increased, hypertension remained relatively stable (15.0%–23.4%), while hyperlipidemia fluctuated between 7.5% and 11.1%. Renal impairment appeared only in severe NPDR (1.6%).

Smoking prevalence ranged from 18.8% to 21.4%, and anemia was uncommon. Diabetic macular edema (DME) showed the highest hyperlipidemia prevalence (45.1%) and increased smoking (34.7%). Proliferative diabetic retinopathy (PDR) had the highest prevalence of hypertension (50.0%), renal impairment (9.1%), and smoking (56.8%), along with the highest anemia rate (4.5%).

Table 2: Prevalence of Systemic Comorbidities Across Different Stages of Diabetic Retinopathy (Dr).

Pathology	Hypertension	Hyperlipidemia	Renal Impairment	Smoking	Anemia
No diabetic retinopathy (140)	22 (15.7%)	15 (10.7%)	0 (0.0%)	30 (21.4%)	2 (1.4%)
Mild NPDR (80)	12 (15.0%)	6 (7.5%)	0 (0.0%)	15 (18.8%)	2 (2.5%)
Moderate NPDR (72)	11 (15.2%)	8 (11.1%)	0 (0.0%)	14 (19.4%)	1 (1.4%)
Sever NPDR (64)	15 (23.4%)	6 (9.4%)	1 (1.6%)	12 (18.8%)	1 (1.6%)
DME (144)	35 (24.3%)	65 (45.1%)	3(2.1%)	50 (34.7%)	4 (2.8%)
PDR (44)	22 (50.0%)	4 (9.1%)	4 (9.1%)	25 (56.8%)	2 (4.5%)

Regarding treatment modalities received by patients at different stages of diabetic retinopathy. No patients with no diabetic retinopathy or mild NPDR received any treatments. in severe NPDR; 15.6% received anti-VEGF, 7.8% steroids and laser treatment, and 12.5% underwent cataract surgery. Diabetic macular edema (DME) had the highest use of anti-VEGF (84.7%), with 29.2% receiving steroids, and 13.9% undergoing laser treatment or cataract surgery, with 6.9% requiring vitrectomy.

50% undergoing cataract surgery, and 18.2% requiring pars plana vitrectomy.

The types and rates of treatment modalities received by patients at different stages of diabetic retinopathy are summarized in table 3.

Proliferative diabetic retinopathy (PDR) showed the highest intervention rates, with all patients receiving anti-VEGF and laser treatment, 90.9% receiving steroids,

Table 3: Types and Rates of Treatment Modalities Received by Patients Among Different Stages of Diabetic Retinopathy (Dr).

Pathology	Anti VEGF	Steroids treatment	Cataract surgery	Laser treatment	Pars plana vitrectomy
No diabetic retinopathy (140)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Mild NPDR (80)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Moderate NPDR (72)	1 (1.4%)	0 (0.0%)	5 (6.9%)	0 (0.0%)	0 (0.0%)
Sever NPDR (64)	10 (15.6%)	5 (7.8%)	8 (12.5%)	5 (7.8)	0 (0.0%)
DME (144)	122 (84.7%)	42 (29.2%)	20 (13.9%)	20 (13.9%)	10(6.9%)
PDR (44)	44 (100%)	40 (90.9%)	22	44 (100%)	8 (18.2%)

DISCUSSION

The findings of this retrospective study reveal a significant burden of diabetic retinopathy (DR) and related complications among Jordanian patients with uncontrolled type II diabetes (HbA1c >8.5%) over five years. DR was diagnosed in 65% of patients, with diabetic macular edema (DME) affecting 36% of eyes. These rates exceed global averages reported in landmark studies such as the Wisconsin Epidemiologic Study of Diabetic Retinopathy (WESDR), which found DR prevalence of ~25–40% after five years in populations with better glycemic control (HbA1c <9%) (Klein et al., 2008).^[11] The higher prevalence in Jordan aligns with regional studies from the Middle East, such as.

Al-Bdour et al. (2008), who reported DR in 58% of Jordanian diabetics, and Abu Samra et al. (2015), who identified DME in 32% of patients.^[7,9] This disparity likely reflects poorer glycemic control (mean HbA1c: 10.2% in this study vs. 8.5–9.5% in global cohorts) and elevated rates of systemic comorbidities such as hypertension (15.7–50.0%) and hyperlipidemia (7.5–45.1%).

Notably, the progression of DR severity correlated with worsening HbA1c levels, escalating from 9.2% in patients without retinopathy to 12.9% in proliferative DR (PDR). This mirrors findings from the UK Prospective Diabetes Study (UKPDS), which established a 37% increase in microvascular complications per 1% rise in HbA1c (Stratton et al., 2000).^[12] However, the prevalence of advanced DR stages in Jordan 16% severe NPDR and 11% PDR—exceeds rates reported in similarly aged cohorts from Europe and North America (Grauslund et al., 2009; Wong et al., 2016),^[13,14] underscoring the urgent need for improved glycemic management in Jordan.

Systemic comorbidities played a critical role in DR progression. Hypertension (50.0% in PDR) and smoking (56.8% in PDR) were disproportionately prevalent in advanced stages, consistent with global trends (Yau et al., 2012).^[15] However, hyperlipidemia rates in DME patients (45.1%) were strikingly higher than those reported in the Multi-Ethnic Study of Atherosclerosis

(MESA) (Wong et al., 2006),^[16] suggesting unique metabolic risk profiles in Jordanian populations, possibly linked to dietary habits and genetic factors (Ajlouni et al., 2019).^[2] Renal impairment, though rare overall (<9.1%), emerged as a marker of advanced disease, aligning with global evidence linking nephropathy to sight-threatening DR (Cheung et al., 2010).^[5]

The treatment modalities observed in our study reflect standard clinical practices for DR management. Anti-VEGF injections were the most commonly administered treatment, particularly in DME (84.7%) and PDR (100%). This is consistent with current guidelines from the American Diabetes Association (ADA, 2023) and studies highlighting the efficacy of anti-VEGF in reducing macular edema and halting disease progression

Compared to global data, our findings align with treatment trends in both developed and developing nations, where anti-VEGF is the first-line therapy for DME, while laser photocoagulation remains essential for PDR. Treatment patterns reflected disease severity: 84.7% of DME patients received anti-VEGF therapy, consistent with international guidelines (ADA, 2023),^[17] while 100% of PDR patients required laser treatment. High rates of surgical interventions were recorded among patients with PDR. In contrast, the low intervention rates were encountered among patients with early stages of diabetic retinopathy.

The reliance on medical records may introduce selection bias and limit the ability to establish causal relationships between risk factors and disease progression. This was the main limitation of this study. In addition, multi center studies are needed for more precise assessment of controlled diabetics among the entire Jordanian population.

CONCLUSION

Diabetic retinopathy (DR) is highly prevalent among Jordanian patients with uncontrolled type 2 diabetes, with significant associations with hypertension, hyperlipidemia, and smoking. The high rates of vision-threatening complications like proliferative DR and diabetic macular edema highlight the need for early

screening, better diabetes management, and improved access to specialized care. Targeted public health interventions and further research on long-term outcomes are essential to reducing DR progression and its impact on quality of life. trends and develop tailored interventions.

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