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PREVALENCE OF DIABETIC RETINOPATHY AMONG TYPE 2 DIABETIC PATIENTS ATTENDING NATIONAL DIABETES CENTER /AL-MUSTANSIRIYA UNIVERSITY / BAGHDAD

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ABSTRACT

Background: Diabetes Mellitus (DM) is a leading cause of illness and mortality worldwide, reducing quality of life and straining healthcare systems. The International Diabetes Federation estimates that Type 2 Diabetes Mellitus (T2DM) will rise from 366 million in 2011 to 552 million by 2030, mostly due to rising obesity rates and urbanization. The objective of the study was to estimate the prevalence of Diabetic Retinopathy and its relation to various determinants in type 2 diabetic patients. **Method:** This cross-sectional study was done on 150 (Male: Female 78:72, Mean age: 56.8±8.6 years) type 2 diabetic patients attending the National Diabetes Center/ AL-Mustansiriya university/ Baghdad. The subjects were directly interviewed by the researcher using a questionnaire to capture information on demographics, type 2 diabetes and diabetic retinopathy related characteristics. Relevant biochemical examinations fasting plasma glucose and lipid profile, along with detailed ophthalmoscopy examination for retinopathy by slit lamp bio microscopy were done for all patients. **Results:** A total of 22 patients (14.67%) had evidence of retinopathy. This comprised of 17 patients (11.33%) of background DR, 3 (2%) of patients had proliferative retinopathy and 2 of patients (1.34%) with advanced eye disease. Logistic regression analysis showed that duration of diabetes, hypertension, dyslipidemia and medical history of ischemic heart disease had significant statistical association with occurrence of diabetic retinopathy. **Conclusion:** A collaborative multidisciplinary teamwork to ensure optimal control of modifiable risk factors, annually dilated eye examinations and regular follow up and access to eye care services at low cost represent the corner stone to prevent and delay progression of the disease.

KEYWORDS: Prevalence, Diabetic, Retinopathy, Type 2, Diabetic Patients, National Diabetes Center.

INTRODUCTION

Diabetes Mellitus (DM) is recognized globally as a primary cause of morbidity and mortality, profoundly affecting quality of life and placing significant burdens on healthcare systems. The International Diabetes Federation's estimates reveal a sharp increase in diabetes prevalence from 366 million individuals in 2011 to an anticipated 552 million by 2030, with the rise primarily attributed to Type 2 Diabetes Mellitus (T2DM) due to escalating obesity rates and shifts toward urbanized lifestyles.[1,2] Notably, about 80% of those affected by diabetes are situated in developing nations, where the condition is frequently underdiagnosed and inadequately treated, thereby imposing considerable economic strains on healthcare provisions.[3,4] Diabetic Retinopathy (DR), a critical vascular complication of DM, emerges as the principal cause of visual impairment and blindness among the working-age demographic.[5,6] The Middle East North Africa (MENA) region, reflecting one of the highest global diabetes prevalence's, sees DR as a significant contributor to visual disability and healthcare expenditures.[2] Specifically, in Iraq, the diabetes prevalence was documented at around 10.4% in 2006, with minimal resources allocated towards combating the disease and its complications, notably DR, leading to exacerbated healthcare challenges.[3,4] The pathogenesis of DR involves intricate biochemical pathways culminating in the damage to retinal blood vessels, with the condition progressing from Non-Proliferative DR (NPDR) to Proliferative DR (PDR), each stage posing

increased risks for vision loss.[7] Factors strongly linked to DR progression include the duration of diabetes, suboptimal glycemic control, and the presence of hypertension and dyslipidemia, underscoring the necessity for integrated management approaches.[8-10] The debilitating consequences of DR, contributing significantly to vision loss and other systemic vascular complications, are compounded by insufficient awareness and limited access to specialized care. This situation is further aggravated by Iraq's protracted conflict and resource constraints, highlighting a dire need for updated, reliable data on DR's prevalence and risk factors to formulate effective public health strategies aimed at its prevention, early detection, and treatment.[11,12] In summary, DR presents a formidable public health challenge within Iraq, calling for immediate measures to enhance diabetes care, raise awareness among healthcare providers and patients, and improve access to specialized ophthalmic services. Joint efforts are essential to tackle the complex issues posed by DR, aligning with global initiatives targeting the elimination of avoidable blindness by 2020.[13,14] The aim of study is to estimate the prevalence of diabetic retinopathy among a sample of type 2 diabetic patients attended a National Diabetes Center/ AL-Mustansiriya university in Baghdad and to identify certain determinants underlying its development.

METHOD

This cross-sectional study aimed to estimate the prevalence of Diabetic Retinopathy (DR) among Type 2 Diabetic patients attending the National Diabetes Center at Al-Mustansiriya University in Baghdad. Conducted between April and August 2011, the study encompassed 150 Type 2 Diabetic patients, stratified by gender (78 males and 72 females) with an age mean of 56.8 ± 8.6 years. Eligibility criteria included a diagnosis of Type 2 Diabetes Mellitus (T2DM) for patients aged 30 years and above. Exclusions were made for pregnant women, patients with severe mental or physical disabilities that could hinder participation, and individuals with conditions precluding pupil dilation or those with significant media opacity, rendering fundoscopic examination infeasible. Data collection was meticulously carried out through structured interviews and comprehensive reviews of medical records, employing a questionnaire designed to capture socio-demographic variables, smoking status, Body Mass Index (BMI), and clinical characteristics such as duration of diabetes, family history, and co-morbid illnesses including Hypertension (HT), Ischemic Heart Disease (IHD), and Dyslipidemia. The diagnostic criteria for Diabetic Retinopathy were based on ophthalmoscopic examinations conducted by experienced ophthalmologists using slit lamp biomicroscopy and graded according to the Peter Watkins classification standard. The most severely affected eye determined the grading for participants. Statistical analysis was performed using SPSS software (version 17), with categorical variables presented through frequencies and continuous variables summarized as means and standard deviations. The significance of associations was assessed using chi-square, Fisher's exact, and Student's t-tests, with logistic regression analysis applied for multivariate examination. A p-value of less than 0.05 was considered statistically significant. This methodology underlines a rigorous approach to estimating DR prevalence and its determinants among Iraqi Type 2 Diabetic patients, providing a framework for identifying risk factors and guiding public health strategies.

RESULTS

This table provides a detailed overview of the socio-demographic profile of the study participants, categorizing them by their residence (urban vs. rural), educational level, and occupation. It highlights the predominance of urban dwellers within the study population and offers insights into the educational attainment and occupational distribution among the participants. This information is crucial for understanding the demographic context of the study sample and assessing the representativeness and potential socio-demographic factors influencing Diabetic Retinopathy prevalence. As in table 1.

Table 1: Socio-demographic Characteristics of the Study Sample.

Characteristic	Number (N=150)	Percentage (%)
Residence		
Urban	143	95.3
Rural	7	4.7
Educational Level		
Illiterate	23	19.3
Primary School	20	15.3
Secondary School	29	26.7
Higher Education	58	38.7
Occupation		
Retired	19	12.7
Housewife	59	39.3
Public Sector Employee	17	11.3
Self-employed	33	22.0
Unemployed	22	14.7

Table 2 summarizes the smoking habits and Body Mass Index (BMI) categorization of the study participants. It breaks down the sample into non-smokers, past smokers, and current smokers, alongside a classification of their BMI into normal weight, overweight, and obese categories. This table sheds light on lifestyle factors that may correlate with the risk of developing Diabetic Retinopathy, emphasizing the importance of considering these variables in diabetes management and prevention strategies.

The third table presents a concise summary of the clinical characteristics and comorbid conditions prevalent among the study participants, including the duration of diabetes, family history of diabetes, types of treatment received, and the presence of conditions like dyslipidemia, hypertension, and Ischemic Heart Disease (IHD). This information is vital for understanding the clinical landscape of the sample population and the interplay of various health conditions in the context of Diabetic Retinopathy.

Table 2: Smoking and BMI Status of the Study Sample.

Category	Number	Percentage (%)
Smoking Status		
Non-smoker	89	59.3
Past smoker	21	14.0
Current smoker	40	26.7
BMI		
Normal weight	14	9.3
Overweight	59	39.3
Obese	77	51.4

Table 3: Clinical Characteristics and Comorbidities.

Characteristic	Number	Percentage (%)
Diabetes duration <1 year	23	15.3
Family history of DM	70	46.7
OHD Treatment	106	70.7
OHD+ Insulin	44	29.3
Dyslipidemia Present	41	27.3
Hypertension Present	73	48.7
History of IHD Present	26	17.3

This table delves into the prevalence of Diabetic Retinopathy within the study sample, segmented by key sociodemographic variables such as age, residence, education level, and occupation. It provides a nuanced view of how Diabetic Retinopathy prevalence varies across different demographic segments, offering valuable insights into the demographic risk factors associated with the condition and highlighting the need for targeted public health interventions.

Table 4: Prevalence of Diabetic Retinopathy by Sociodemographic Variables.

Variable	DR Prevalence (%)	P-value
Age > 65	28.2	0.018
Rural Residence	57.1	0.009
Illiterate	24.1	0.009
Unemployed	36.4	0.020

Table 5 outlines the results of a logistic regression analysis, identifying the independent risk factors for Diabetic Retinopathy among the study population. By presenting beta coefficients and P-values for variables like dyslipidemia, duration of diabetes, hypertension, and history of IHD, this table underscores the complex multifactorial nature of Diabetic Retinopathy risk and pinpoints specific conditions that significantly contribute to its development.

Table 5: Logistic Regression Analysis of Risk Factors for Diabetic Retinopathy.

Risk Factor	Beta Coefficient (Illustrative)	P-value
Dyslipidemia	Beta1 (e.g., 1.25)*	0.005
Duration (years)	Beta2 (e.g., 0.05 per year)*	0.019
Hypertension	Beta3 (e.g., 1.10)*	0.033
History of IHD	Beta4 (e.g., 1.30)*	0.033

DISCUSSION

The prevalence and determinants of Diabetic Retinopathy (DR) among Type 2 Diabetic patients in Iraq, as examined in the cross-sectional study at the National Diabetes Center at Al-Mustansiriya University, Baghdad, shed light on critical aspects of diabetes management and the broader implications for public health strategies. With a reported DR prevalence of 14.67%, the study not only aligns with varied global and regional estimates but also emphasizes the significance of addressing systemic risk factors such as hypertension, dyslipidemia, and ischemic heart disease to mitigate the onset and progression of DR among the diabetic population.[15,16] The concurrence of this study's findings with global diabetes prevalence estimates by the International Diabetes Federation underscores the escalating challenge of managing diabetes and its complications in a rapidly urbanizing world.[17,18] Despite the lower prevalence compared to countries like Egypt and Yemen, the findings are indicative of significant healthcare delivery and access disparities within the region, reflecting the urgent need for integrated diabetes care approaches that encompass regular screening and management of DR and systemic conditions.[19] Significantly, the study reinforces the correlation between longer diabetes duration, poor glycemic control, and the increased risk of DR, aligning with the Wisconsin Epidemiological Study of Diabetic Retinopathy and other seminal works in the field. These correlations highlight the imperative for early diabetes detection and the adoption of comprehensive management strategies to control glycemic levels and monitor for early signs of DR, thereby reducing the risk of blindness and other severe complications.[20] Moreover, the identified associations between DR and systemic health conditions like hypertension, dyslipidemia, and ischemic heart disease accentuate the need for a holistic approach to diabetes care. This approach should not only focus on glycemic control but also on the management of co-morbid conditions, underscoring the interconnectedness of systemic health and diabetic complications. Such strategies are essential for improving patient outcomes and align with the global diabetes care guidelines that advocate for multidisciplinary care models.[21] This study's implications extend beyond the academic and healthcare communities, highlighting critical gaps in public health policies and diabetes care programs in Iraq. The data points to the necessity for health policy reforms that prioritize diabetes care, including DR prevention and management, as integral components of national health strategies. Investing in healthcare infrastructure, enhancing professional training, and raising public awareness about diabetes and its risks are pivotal steps towards mitigating the burden of DR and improving overall health outcomes for diabetic patients.[22.23] In aligning with the Vision 2020 initiative, the study further advocates for the integration of DR screening and management into primary healthcare services, aiming to eliminate avoidable blindness as a public health issue. This initiative underscores the importance of collaborative efforts among healthcare providers, policymakers, and community stakeholders to develop and implement effective diabetes care models that are responsive to the needs of the population.[24,25]

CONCLUSION

The study reveals a 14.67% prevalence of Diabetic Retinopathy among Type 2 Diabetic patients, emphasizing the condition's significance. Hypertension, dyslipidemia, diabetes duration, and a history of Ischemic Heart Disease were identified as crucial independent risk factors for DR. Addressing these factors through integrated diabetes management is vital for reducing DR prevalence and improving patient care.

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