The Awareness and Assessment of Diabetic Retinopathy in Diabetic Patients Attending Ophthalmology Clinics and Hospitals in Abha, Saudi Arabia

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ABSTRACT

Study Design: Cross sectional

Background: Diabetes affects 422 million people worldwide, with the majority living in developing countries. Diabetes is currently one of the world's fourth leading causes of death. Global diabetes estimates for adults over the age of 18 The proportion of people over the age of 65 increased from 4.7% in 1980 to 8.5% in 2014. Diabetes can be controlled so that its consequences are minimized. Diabetic Retinopathy is a leading cause of blindness; this is due to long-term accumulation of damage to small blood vessels within the retina Diabetes is responsible for 2.6% of global blindness.

Methods: In this cross - sectional study data was collected by the purposely constructed questionnaire. Questionnaire composed of the demographic items and items related to the awareness and knowledge about of diabetic retinopathy in diabetic patients Questionnaire was constructed after the series of discussions between the panel of experts this panel composed of from subject specialist, researcher, language expert. Cronbach alpha of the questionnaire was calculated. The study was conducted in the Aseer region of Saudi Arabia.

Results: We have received 434 filled questionnaire so the response rate was 87%. Mean(SD) of the age was 37.8(9.6). 39.4% were females while 60.6% were male respondents.23.7% have HTN as an other chronic disease, 16.4% were smokers, 42.9% have DM duration less than 5 years,26.3% have DM duration more than 15 years.28.6% have more than high school level of education. 70.3% have DM patients in family while 38.5% have more than 7 cumulative sugar level.

Conclusion: The majority of patients get their information from their doctors. These findings highlight the importance of increasing diabetic retinopathy awareness among Saudi diabetics, as well as the importance of annual ophthalmic eye screening.

Keywords: Awareness, Assessment, Diabetic retinopathy, Eye screening

INTRODUCTION

Diabetes affects 422 million people worldwide, with the majority living in developing countries. Diabetes is currently one of the world's fourth leading causes of death. Global diabetes estimates for adults over the age of 18 The proportion of people over the age of 65 increased from 4.7% in 1980 to 8.5% in 2014[1]. Diabetes can be controlled so that its consequences are minimized. Diabetic Retinopathy is a leading cause of blindness; this is due to long-term accumulation of damage to small blood vessels within the retina Diabetes is responsible for 2.6% of global blindness. Diabetes mellitus affects the eyes, causing cataracts, glaucoma, and diabetic retinopathy. Diabetic retinopathy affects diabetic patients' eyes and involves a disorder of the blood vessels of the retina, which can lead to blindness in people aged 20 to 60[2]. Diabetic retinopathy is asymptomatic in its early stages. Hence, regular screening of diabetic patients and periodic follow up remains the only option to detect and treat the condition before it causes visual loss. However, many studies have suggested that this can be achieved only with better awareness and knowledge on diabetes and its complications like diabetic retinopathy and its effects on vision; due to lack of awareness there is delay in diagnosis and management[3]. DR has emerged as a major cause of visual disability in adults, leading to irreversible blindness. It starts as a neuro-retinopathy, then progresses to vascular changes caused by a breakdown of the blood-retinal barrier and obliteration of retinal capillaries. Uncontrolled glucose levels, age, having diabetes for a longer period of time, hypertension, smoking, and hypercholesterolemia are all risk factors that aggravate DR complications[4].

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The prevalence of diabetic retinopathy in T2DM is 28.5% in those aged 40 and older in the United States, while the global prevalence is estimated to be 34.6%; nearly 93 million people are affected. The prevalence varies by country; in the United Arab Emirates (UAE), diabetic retinopathy was found to be 19%. Jordan has 64%, Kuwait has 8%-12%, Egypt has 42%, and Oman has 42.4%[5,6].

In Saudi Arabia, the prevalence of DR was found to be 28%-36% among diabetic patients from various regions of the country the prevalence was estimated in other Saudi regions including AlTaif, Al-Hasa (33% in both regions), but the highest prevalence was found in Al-Madinah (36%). According to one Saudi study, 36.4% of T2DM patients had DR[7].

Diabetes mellitus causes cataracts, glaucoma, and diabetic retinopathy in the eyes. Diabetic retinopathy is a condition that affects the eyes of diabetic patients and is caused by a disorder of the blood vessels of the retina, which can lead to blindness in people aged 20 to 60[8].

The level of knowledge and understanding of DR is critical for the timely diagnosis and intervention of any potential visual impairment. Diabetic patients usually follow up with family medicine doctors or primary care clinics. Patients should aim to notify their primary care physicians of any changes in their vision or diabetes control. It is worth noting that delaying the referral of DR patients may have an impact on the patient's quality of life as well as the financial burden on the healthcare system[8-10]. The main objective of this study is to assess the knowledge and awareness about diabetic retinopathy in diabetic patients.

METHODS

In this cross - sectional study data was collected by the purposely constructed questionnaire. Questionnaire composed of the demographic items and items related to the awareness and knowledge about of diabetic retinopathy in diabetic patients Questionnaire was constructed after the series of discussions between the panel of experts this panel composed of from subject specialist, researcher, language expert. Cronbach alpha of the questionnaire was calculated. The study was conducted in the Aseer region of Saudi Arabia.

After collection of data, data was coded and entered in the SPSS ver.20 software for analyses descriptive statistics (mean standard deviation, frequencies and percentages were computed), to measure the significance chi-square test was used at 5% level of significance. Data was collected from diabetic patients attending ophthalmology clinics and hospitals in Abha, Saudi Arabia. Ethical approval was obtained from King Khalid university, Saudi Arabia. The study duration was from January-2022 to April-2022. Written consent was obtained from the patients.

Inclusion Criteria: type 1 and 2 diabetes mellitus patients aged 20 years and above who were already diagnosed with diabetes and meet the standard criteria of the American diabetic association.

Exclusion Criteria: patients with mature cataract or hypertensive retinopathy, patients who were exposed to radiation or have any other eye disease, and patients who are unable to answer the questionnaires or refused to give consent.

RESULTS

The Cronbach alpha of the questionnaire was 0.82. out of 500 questionnaire distributed, we have received 434 filled questionnaire so the response rate was 87%. Mean (SD) of the age was 37.8 (9.6). 39.4% were females while 60.6% were male respondents. 23.7% have HTN as an other chronic disease, 16.4% were smokers, 42.9% have DM duration less than 5 years, 26.3% have DM duration more than 15 years. 28.6% have more than high school level of education. 70.3% have DM patients in family while 38.5% have more than 7 cumulative sugar level (Table 1).

Table 1: Demographics and DM related items

Do you have other chronic diseases?		
	Frequency	Percent
Asthma	6	1.38%
Cardiac Diseases	24	5.53%
Hypertension	103	23.73%
Thyroid Diseases	8	1.84%
Kidney disease	7	1.61%
No other chronic Diseases	286	65.90%
Do you smoke ?		
	Frequency	Percent
no	363	83.6%
yes	71	16.4%
Duration of diabetes		
	Frequency	Percent
11-15 years	54	12.4%
6-10 years	80	18.4%
less than 5 years	186	42.9%
More than 15 years	114	26.3%
Education level?		
	Frequency	Percent
Primary	85	19.6%
Middle school	77	17.7%
high school	136	31.3%
Bachelor	80	18.4%
Master's	40	9.2%
PhD	4	0.9%
illiterate	12	2.8%
Is there anyone else with diabetes in the family?		
	Frequency	Percent
no	129	29.7%
yes	305	70.3%
Gender		
	Frequency	Percent
female	171	39.4%
male	263	60.6%
The age?		
	Frequency	Percent
20-30	144	33.2%
31-40	95	21.9%
41-60	127	29.3%
more than 60	68	15.7%
What is the cumulative sugar level?		
	Frequency	Percent
I don't know	146	33.6%
less than 7	121	27.9%
more than 7	167	38.5%

As per table 2, 66.8% were agreed that DM can cause DR, 56.5% agreed that DR van cause glaucoma, 58.8% agreed that DR can lead to blindness, 73.7% were agreed that DR may lead to distorted vision,

81.6% agreed that regular examination of a diabetic patient is necessary to prevent retinopathy (Table 2).

Table 2: Awareness and knowledge

Do you know what are the factors that lead to diabetes and that may lead to an increase in the possibility of developing the eye disease?		
	Frequency	Percent
I do not know	76	17.5
no	68	15.7
yes	290	66.8
Do you think that diabetic retinopathy may lead to blindness?		
	Frequency	Percent
I do not know	133	30.6
no	46	10.6
yes	255	58.8
Do you think that diabetic retinopathy may lead to distorted vision?		
	Frequency	Percent
I do not know	86	19.8
no	28	6.5
yes	320	73.7
Do you think that regular examination of a diabetic patient is necessary to prevent retinopathy?		
	Frequency	Percent
I do not know	57	13.1
no	23	5.3
yes	354	81.6

As per table 3, 42.9% were agreed that controlling the level of glucose (sugar) in the blood is sufficient to treat retinopathy without any other intervention. 69.6% opted yes in response of the question that Do you think that the length of time you have had diabetes may be a factor in increasing your risk of developing retinopathy? 68.8% agreed that T1DM and T2DM were one of the root cause of DR. 55.1% opted yes in response of the question that Do you think that irregular high blood pressure may be an influential factor for retinopathy? (Table 3)

Table 3: Knowledge and awareness regarding the actors associated with DR

Do you think that controlling the level of glucose (sugar) in the blood is sufficient to treat retinopathy without any other intervention?		
	Frequency	Percent
I do not know	152	35.0
no	96	22.1
yes	186	42.9
Total	434	100.0
Do you think that the length of time you have had diabetes may be a factor in increasing your risk of developing retinopathy?		
	Frequency	Percent
I do not know	86	19.8
no	46	10.6
yes	302	69.6
Do you think that type 1 and type 2 diabetes may be an influential factor for retinopathy?		
	Frequency	Percent
I do not know	97	22.4
no	40	9.2
yes	297	68.4
Do you think that irregular high blood pressure may be an influential factor for retinopathy?		
	Frequency	Percent
I do not know	140	32.3
no	55	12.7
yes	239	55.1

Table 4 depicted that, 44.5% agreed that smoking may be an influence factor for retinopathy, 56.5% agreed that having a family history may be an influential factor for retinopathy, 45.4% agreed that an increase in the level of cholesterol in the blood may be an influential factor in retinopathy, 26.7% agreed that pregnancy increases the incidence of retinopathy, 71.7% agreed on that an increase in blood sugar may increase the incidence of retinopathy (Table 4).

Table 4: Practices and awareness regarding the causes of DR

Do you think that smoking may be an influence factor for retinopathy?		
	Frequency	Percent
I do not know	176	40.6
no	65	15.0
yes	193	44.5
Do you think that having a family history may be an influential factor for retinopathy?		
	Frequency	Percent
I do not know	124	28.6
no	65	15.0
yes	245	56.5
Do you think that an increase in the level of cholesterol in the blood may be an influential factor in retinopathy?		
	Frequency	Percent
I do not know	159	36.6
no	78	18.0
yes	197	45.4
Do you think that pregnancy increases the incidence of retinopathy?		
	Frequency	Percent
I do not know	184	42.4
no	134	30.9
yes	116	26.7
Do you think that an increase in blood sugar may increase the incidence of retinopathy?		
	Frequency	Percent
I do not know	84	19.4
no	39	9.0
yes	311	71.7

In table 5, we have compared gender with Do you think that type 1 and type 2 diabetes may be an influential factor for retinopathy? Do you think that smoking may be an influence factor for retinopathy? And Do you think that diabetic retinopathy may lead to blindness? And we did not observe any significant differences.

Table 5: Gender wise comparisons

			Do you think that type 1 and type 2 diabetes may be an influential factor for retinopathy?			Total
			I do not know	no	yes	
Gender	female	Count	39	13	119	171
		%	22.8%	7.6%	69.6%	100.0%
	male	Count	58	27	178	263
		%	22.1%	10.3%	67.7%	100.0%

Total		Count	97	40	297	434
		%	22.4%	9.2%	68.4%	100.0%
p=0.644						
			Do you think that smoking may be an influence factor for retinopathy?			Total
			I do not know	no	yes	
Gender	female	Count	67	24	80	171
		%	39.2%	14.0%	46.8%	100.0%
	male	Count	109	41	113	263
		%	41.4%	15.6%	43.0%	100.0%
Total		Count	176	65	193	434
		%	40.6%	15.0%	44.5%	100.0%
p=0.727						
			Do you think that diabetic retinopathy may lead to blindness?			Total
			I do not know	no	yes	
Gender	female	Count	54	15	102	171
		%	31.6%	8.8%	59.6%	100.0%
	male	Count	79	31	153	263
		%	30.0%	11.8%	58.2%	100.0%
Total		Count	133	46	255	434
		%	30.6%	10.6%	58.8%	100.0%
p=0.604						

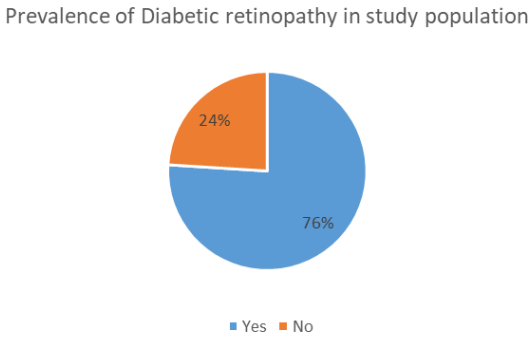

Figure 1: Prevalence of diabetic retinopathy in study population

Figure 1 depicted the prevalence of DR was 76% among the DM patients included in this study

DISCUSSION

The current study enrolled 434 diabetic patients. Hypertension was the most common co morbidity. The lack of awareness about DR is a major health concern because it interferes with the treatment and prevention of diabetic vision impairment. The prevalence of diabetic retinopathy in this study was 76% which is consistent with other 5 studies that revealed the prevalence of diabetic retinopathy was 44.4%, 37%, 28.9%, 28.5%, and 27%, respectively, where the results in this study are slightly higher. Males had a higher prevalence of diabetic retinopathy (65.2%), but there was no statistically significant relationship between gender and diabetic retinopathy P=0.789[10,11].

The majority of subjects in this study were aware that diabetes can affect the eyes, and 69% were aware that diabetes can lead to blindness. Our study was hospital-based, and the participants had previously been diagnosed with diabetes, which may have contributed to the study group's increased awareness of DR. In one study from India, researchers in Hyderabad discovered that 74% of diabetics were aware that diabetes could harm the retina[12,13].

In the current study, many subjects were aware that eye screening should be done at least once a year (annually or every six months), but a significant number of patients thought of screening only when their vision deteriorated. This suggests that diabetes patients are unaware of how frequently they should have their eyes checked[14]. Our study found that the majority of diabetic patients were aware that diabetes can harm their vision and that controlling blood sugar levels can help preserve vision. The vast majority of patients also knew that diabetes could result in blindness.

This study found that education level strongly predicts awareness of eye complications and the need for regular eye exams. This has been supported by other studies in Iran and Oman but refuted in other countries such as Ireland, and the difference may be due to other factors such as sample selection, study location, and other factors.

In this study, there was a significant association between patient age and diabetic retinopathy (p less than 0.000). Other studies have found and reported a similar relationship[15].

The current study has several strengths: I it investigated diabetic individuals' awareness in detail and assessed overall knowledge, (ii) it included a relatively larger sample population compared to published reports in the literature, and (iii) patients were invited from primary health care, which makes them representative of the level of awareness and real practices and minimizes selection bias. Nonetheless, this study has limitations. It was restricted to one city in Saudi Arabia, which may affect the generalizability of our findings.

CONCLUSION

Despite the fact that diabetics are well aware of the presence of eye complications in DM, awareness of regular eye checkups is low. Furthermore, there is the issue of how and when to perform examinations, which is more prevalent in patients with a longer duration of DM, and education level is a major determinant of awareness. The majority of patients get their information from their doctors. These findings highlight the importance of increasing diabetic retinopathy awareness among Saudi diabetics, as well as the importance of annual ophthalmic eye screening.

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Competing Interest: None

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