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Awareness of Diabetic Retinopathy among Type II Diabetic Patients Attending at King Salman Armed Forced Hospital-Primary Health Care, Tabuk 2019

Amal Mohammed Albalawi[1*], Tahani Khalil[1], Reham Abdalmajeed Alimam[2], Ayah Suliman Albalawi[3]

[1]Family Medicine Department, King Salman Armed Forces Hospital, Tabuk, Saudi Arabia; [2]Internal Medicine Department, King Salman Armed Forces Hospital, Tabuk, Saudi Arabia; [3]Batterjee Medical College, Jeddah, Saudi Arabia

Abstract

BACKGROUND: Diabetic retinopathy refers to vascular disease of the retina that affects patients who have been diagnosed with type II diabetes mellitus. Information about DR must be spread the population, especially diabetic patients. Tools for DR screening are available and easy to access. No similar study was carried out in Tabuk to assess awareness of DR among type II diabetic patients up to our knowledge.

AIM: To assess awareness of diabetic retinopathy among type II diabetic patients.

METHODS: A cross-sectional study carried out in Tabuk city at King Salman Armed Forced Hospital-Primary Health Care Centers among type II diabetic patients attending at the period of study (n = 382) to assess their awareness about diabetic retinopathy.

RESULTS: Out of 382 diabetics patients, (41.4%) had DM less than 5 years, (34.8%) had DM more than 10 years, and (23.8%) had DM between 5-10 years, (30.1%) had university degree, (42.4%) considered having low income, (57.6%) were screened for DR in the past year, (18.1%) of participant think that Seeing optometrist is enough for DR diagnosis. The total knowledge score about DR with a mean ± SD of 6.4 ± 1.5, indicating poor knowledge level, where 180 (47.1%) had poor knowledge, 106 (27.7%) had moderate knowledge, and 96 (25.2%) had good knowledge.

CONCLUSION: Almost the Awareness of Type II Diabetic Patients Attending at king Salman Armed Forced Hospital-Primary Health Care centre regarding Diabetic Retinopathy needs to be improved.

Introduction

Diabetic retinopathy refers to the vascular disease of the retina that affects patients who have been diagnosed with type II diabetes mellitus. In the United States, the condition has been known to be the leading cause of blindness among people aged between 20 and 60 years [1].

With Diabetes mellitus becoming increasingly common in the majority of countries, the prevalence of diabetic retinopathy has also been anticipated to grow exponentially. This condition has been estimated to cause blindness to close to 34 million diabetic patients worldwide. Several factors have been associated with

the condition. Some of these factors include hypertension, renal failure, glycemic control, and hyperlipidemia, among other factors.

Across the globe, many diabetic patients are unaware of the severity of this condition, yet research anticipates that patient knowledge can be key to improve management of the condition in the future, especially in a country like Saudi Arabia. In this study, therefore, we are interested in researching about the level of knowledge that diabetic patients have regarding diabetic retinopathy in PHC clinics at KSAFH in Tabuk region. To understand the severity of diabetic retinopathy, it is important also to have a look at the manifestation of the condition. Its manifestation often begins with diabetes damaging the minor blood vessels located in the retina [1]. These blood vessels

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are the tissues that are sensitive to light at the back of the eye. By damaging the light-sensitive blood vessels at the back of the eye. This condition would then progress by causing leakage of the blood vessels in the retina. As a result, the condition would lead to a distortion of vision. In advanced stages, new blood vessels would multiply on the retinal surface. At this point, diabetic retinopathy leads to a condition known as diabetic macular oedema — a bulge in the area around the retina called the macula [2]. This condition further caused scarring and loss of cells in the retina, which further leads to blindness. Therefore this study aims to assess the awareness of diabetic retinopathy among type II diabetic patients attending King Salman Armed Forced Hospital primary health care, Tabuk, Saudi Arabia.

Methods

Study Design: A cross-sectional study.

Study area: The study was carried out in Tabuk City in northwestern Saudi Arabia, which is located 2200 feet above sea level; it has a population of 535443 (2015 census).

Study setting: King Salman Armed Forced Hospital-Primary Health Care Center Tabuk, Saudi Arabia.

Study population:

Therefore, diabetic patients visiting the KSAFH-PHC throughout the study period from February to April 2019.

Sample Size:

For this study.

For the sample size, the equation below was used to calculate:

$$n = \frac{2(Z_\alpha + Z_{1-\beta})^2 \sigma^2}{\Delta^2}$$

From the equation,

Z refers to a constant set by convention to accept the alpha level of significance. Additionally,

σ refers to the estimated standard deviation.

Δ stands for the effect difference of two required interventions, called the estimated effect size.

The calculated minimum sample size is:

$$n = \frac{2(1.96 + .8416)^2 (.72)^2}{(.15)^2} = 362$$

Selection Criteria

Inclusion Criteria: Type II Diabetic Patients, Saudi Male and Female.

Exclusion Criteria: Type 1 diabetic patients, Non-Saudi, Patients with chronic eye disease.

Data Collection tool

For data collection, the study was used as a pre-designed valid questionnaire that was used in a previously published study conducted in Taif [12]. Permission to use the questionnaire was obtained through personal communication with the author. The questionnaire included information regarding Socio-demographic characteristics: gender, age, educational level, salary, duration of diabetes, type of medication, smoking, physical examination. Awareness and knowledge toward DR. The questionnaire has contained a total of 10 questions: three of the questions about knowledge of DR, 5 others for screening and the remaining 2 for prevention and treatment.

Data entry and analysis

All collected data were entered, stored and analysed using the Statistical Package for Social Science (SPSS) version 20.

Ethical consideration

Approval by the local research ethics committee at King Salman Armed Forced Hospital was obtained before conducting the study. Permission to use the questionnaire requested through an e-mail communication with the corresponding author of the research, written consents of participants were taken before data collection. The privacy of the information was considered. Ethical consideration was taken through all research steps.

Budget/Funding: Self-funded

Utilisation

With this study, however, there can be an insight to improve education for low-income families and increase their exposure to the knowledge of diabetic retinopathy.

Conflict of interest: None.

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Results

Out of 382 diabetics patients, 198 (51.8%) were male, and 184 (48.2%) were female, 156 (40.8%) were from group age 41-55 years, and 123 (32.2%) were from group age 26-40. Almost the third 115 (30.1%) had a university degree, and 108 (28.3%) attend high school, 162 (42.4%) had monthly income less than 5000. Less than fifth 59 (15.4%) were smokers, and 50 (13.1%) reported physical activity (Table 1).

Table 1: Demographic data

Variable	N	%
Gender		
Female	198	51.8
Male	184	48.2
Age		
Less than 25	8	2.1
26-40	123	32.2
41-55	156	40.8
56-70	95	24.9
Education		
Elementary	57	14.9
Intermediate	55	14.4
High school	108	28.3
University	115	30.1
Other	47	12.3
Monthly-income		
Less than 5000	162	42.4
5000-10000	116	30.4
10001-15000	66	17.3
More than 15000	38	9.9
Smoking		
No	323	84.6
Yes	59	15.4
Physical activity		
No	332	86.9
Yes	50	13.1

Less than half 158 (41.4%) had DM less than 5 years, 133 (34.8%) had DM more than 10 years, and 91 (23.8%) had DM between 5-10 years. Half of the patients191 (50.0%) received pills, 96 (25.1%) received insulin, and 95 (24.9%) received both treatments. Almost two thirds 239 (62.6%) reported controlling blood sugar (Table 2).

Table 2: DM characteristics

Variable	N	%
Duration		
Less than 5 years	158	41.4
5-10 years	91	23.8
More than 10 years	133	34.8
Medication		
Pills	191	50.0
Insulin	95	24.9
Both	96	25.1
Controlling blood sugar		
No	143	37.4
Yes	239	62.6

The majority of the participants reported the following information; "blood sugar controlling reduce and prevent retinopathy" by 359 (94.0%), "there is relation between DM and retinopathy" by332 (86.9%), "retinopathy is a treatable condition" by 329 (86.1%), "seeing optometrist (regular eyeglass store) is not enough for people with diabetes" by 313 (81.9%), "DM can cause blindness" by 300 (78.5%), "periodic eye examination is required even blood sugar is under control" by 274 (71.7%) and "eye problems can occur at the same time of Diabetes diagnosis" by 255

(66.8%). Less than half reported the following information; "diabetics patients should undergo an eye checkup at the same time of diagnosis" by 176 (46.1%), "diabetics patients should undergo an eye checkup annually" by 61 (16.0%). More than half 215 (56.3%) reported: "don't know the treatment methods" (Table 3).

Table 3: Knowledge about DM retinopathy

Variable	N	%
There is a relationship between diabetes and damage or retinopathy		
No	50	13.1
Yes	332	86.9
Diabetic retinopathy can be prevented or reduced by control blood sugar level		
No	23	6.0
Yes	359	94.0
The level of sugar in the blood is regular you do not require a periodic eye examination		
No	274	71.7
Yes	108	28.3
Have your eyes been checked by a doctor last year		
No	162	42.4
Yes	220	57.6
Diabetes mellitus may lead to blindness		
No	82	21.5
Yes	300	78.5
Diabetic patient have eye problems at the same time of Diabetes diagnosis		
No	127	33.2
Yes	255	66.8
How frequently should a person with diabetes undergo an eye check-up		
After one year of diagnosis	55	14.4
At the same time of diagnosis	176	46.1
Only when vision affected	151	39.5
In your opinion how many times should visit Ophthalmology doctor to screen eye and retina		
Annually or every two years	61	16.0
only if there are eye symptoms	63	16.5
Every six months	258	67.5
Retinopathy is a treatable condition		
No	53	13.9
Yes	329	86.1
Treatment methods		
Good control of diabetes alone is sufficient	92	24.1
Laser treatment	57	14.9
Surgical treatment	18	4.7
I do not know	215	56.3
Seeing optometrist (regular eyeglass store) is enough for people with diabetes		
No	313	81.9
Yes	69	18.1

More than half 220 (57.6%) reported "checking eyes last year". The main reason for checking eyes was "referral from the doctor" by 241 (63.1%), while, the mean reasons for not checking were "Lack of awareness of the knowledge of eye diseases of diabetes" by 148 (38.7%) and "Difficulty getting appointments or not having an ophthalmologist" by 108 (28.3%) (Table 4).

Table 4: Eye checking

Variable	N	%
Checking eye by a doctor last year		
No	162	42.4
Yes	220	57.6
Reason to check eye		
referral from the doctor	241	63.1
Through awareness and knowledge	141	36.9
The reason not to check eye		
Material costs	28	7.3
Fear of discovering something dangerous	37	9.7
Difficulty getting appointments or not having an ophthalmologist	108	28.3
Lack of awareness of the knowledge of eye diseases of diabetes	148	38.7
Not enough time	61	16.0

The mean knowledge score was 6.4 ± 1.5, indicating poor knowledge level, where 180 (47.1%) had poor knowledge, 106 (27.7%) had moderate knowledge, and 96 (25.2%) had good knowledge (Table 5).

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Table 5: Knowledge score

Variable	Mean ± SD	Rang (min-max)
Knowledge score	6.4 ± 1.5	(1.0-10.0)
Variable	N	%
Knowledge score category		
Poor	180	47.1
Moderate	106	27.7
Good	96	25.1

The results revealed no significant difference in knowledge level regarding demographic data, even that female, those who were younger age, those who had higher educational level, those who had higher monthly income, those who were non-smokers, those who were physically active, those who had longer duration of DM, and those who controlled blood sugar had better knowledge (Table 6).

Table 6: The relation between knowledge level and demographic and DM characteristics

Variable		Mean	±	SD	P-value
Gender	Female	6.56	±	1.42	0.089
	Male	6.29	±	1.58	
Age	Less than 25	7.50	±	0.53	
	26-40	6.41	±	1.45	0.245
	41-55	6.41	±	1.49	
	56-70	6.38	±	1.62	
Education	Elementary	6.33	±	1.48	
	Intermediate	6.36	±	1.53	
	High school	6.32	±	1.59	0.414
	University	6.66	±	1.35	
	Other	6.29	±	1.65	
Monthly- income	Less than 5000	6.42	±	1.49	
	5000-10000	6.43	±	1.43	
	10001-15000	6.41	±	1.67	0.992
	More than 15000	6.50	±	1.52	
Smoking	No	6.49	±	1.42	0.056
	Yes	6.08	±	1.86	
Physical activity	No	6.41	±	1.49	0.577
	Yes	6.54	±	1.59	
Duration	Less than 5 years	6.29	±	1.62	
	5-10 years	6.56	±	1.42	0.398
	More than 10 years	6.52	±	1.42	
Controlling blood sugar	No	6.36	±	1.36	0.243
	Yes	6. 55	±	1.58	

Discussion

Knowledge of retinopathy is an essential step for an appropriate and timely referral. Delay in seeking care is one of the key factors leading to eye complications [3]. Therefore, sufficient knowledge of retinopathy is fundamental to diabetic patients for proper medical care services [4]. On the other hand, poor knowledge of retinopathy delays seeking cares and finally greater risk of blindness. Raising awareness for diabetic patients to know about retinopathy would improve early detection of problems and reduces the delay of seeking ophthalmology care [3], [4]. The present study aimed to evaluate knowledge of 382 diabetic patients about retinopathy and the factors associated with insufficient knowledge among them. Results of this study showed that almost the half of diabetic patients attending King Salman Armed Forced Hospital-Primary Health Care had poor knowledge regarding retinopathy, while fourth of them had moderate knowledge, and (25%) had good knowledge. The levels of diabetic patients' knowledge regarding retinopathy have been reported by several studies, which are lower than Alasiri and Bafaraj study in Jeddah, reported that (61.0%) of diabetic patients had good knowledge about retinopathy [5]. A similar result was reported in Hail-Saudi Arabia, where the awareness level of DR showed a 76% awareness [6]. Also, in Myanmar, where retinopathy awareness rate amongst diabetic outpatients was 86% [7] and in Nigeria was 84.3% [8].

This result showed that it is well known that awareness is a vitally important step in the creation of a successful program to battle against any disease in the community [5].

In this study, most of the patients, 332 (86.9%), were seen to be aware that diabetes can affect the eye and cause retinopathy, were fourth of them, 108 (28.3%), said that with controlled diabetes, they need not undergo eye screening and 151 (39.5%) also felt the need to go for eye checkup only when vision is affected. The awareness about treatment options available for diabetic retinopathy was less than half (43.7%). In this study, most of the patients, 332 (86.9%), we're aware that diabetes can affect the eye which is higher as compared to studies done in Jeddah where 82% were aware, [11] in India 58.7% were aware, (12) in Bagalkot (13) 45.7% were aware and 37.1% were aware in the study done in Tamil Nadu (14). This awareness was low as compared to studies from Jordan (98.3%) (15), Switzerland (96%) (16), and Oman (93%) (17). This difference could be due to the variety of socio-economic factors and geographic areas.

Majority of the patients 94% believed that patients with controlled diabetes would prevent or reduce eye problem which is higher as compared to the findings done in India (83.3%), (12) in Bagalkot (68%) (13) and Malaysia (51.1%) (18).

Only 28.3% of patients felt the need for eye checkup when his/her diabetes was uncontrolled. Nevertheless, Larger proportions of patients (71.7%) were under the correct impression that eye checkups are still necessary for spite of well-controlled diabetes mellitus. This was low when compared to studies done in India (52.7%), (12) in Bagalkot (76.6%) (13) and Malaysia (91.2%) (18) where most of them felt the need for eye checkup when his/her diabetes was uncontrolled and only 23.3% felt the need for eye checkup even with controlled diabetes as per study was done in Bagalkot, (13) whereas 67.2% as per Malaysia study (18), and 30% as per India study (12).

In our study, when patients were asked about frequency of regular eye checkup, 39.5% felt that they need to go for it only when vision is affected which is inconsistent to the findings of a study done in Bagalkot (13) and Malaysia (18) where it was 38% and 21.9%, respectively. While it is lower in comparison to the findings (77.2%) were seen in a study done in Kerala (19) and India study (70.7%)

(12).

Awareness about treatment options for diabetic retinopathy was low as 56.3% did not know about it. These findings were lower in compare to the studies done in India (90.0%), (12) in Bagalkot (74.7%) (13) and Malaysia (72.3%), (18) While, in the study done in Tamil Nadu (14) better knowledge about treatment options available was reported where only 22.5% who did not know about it.

The most common barrier for undergoing eye screening was the lack of knowledge about the importance of eye screening, followed by a lack of access to eye care and time limitations. Comparable reasons were given by patients in studies done in India, (12) Vellore (20), Jordan (15) and Taif (3).

These findings indicate the importance of receiving the correct education messages from their proper sources. Information given to diabetic patients should not just be on the nature of ocular complications of diabetes, but also on the risk factors for these complications and how to prevent them.

In conclusion, almost half of diabetic patients have poor knowledge regarding diabetic retinopathy, while fourth of them had good knowledge. The best correctly information about DM retinopathy among diabetic patients were the relationship between diabetes and damage or retinopathy, Diabetic retinopathy can be prevented or reduced by control blood sugar level, and Retinopathy is a treatable condition while the least correctly information about DM retinopathy were frequency of checking and screening and treatment methods. More than half of DM patients checked their eyes last year, where the main reason for checking was a referral from doctors, and the main reasons for not checking were lake of awareness and difficulty in taking appointment. Diabetic patients with good knowledge about diabetic retinopathy were female, younger age, higher education level, high monthly income, non-smokers, those who were physically active.

Based on the findings in this study, the following are recommended:

1) Primary health care providers are requested to provide the necessary health education about diabetic retinopathy for all diabetic patients through the regular visit and must be repeated at every visit.

2) Health education messages to diabetic patients about diabetic retinopathy should cover the main points of the knowledge gap, especially the frequency of screening and treatment methods.

3) Health education messages about diabetic retinopathy to diabetic patients should be enforced for those who are old, illiterate, unemployed, and low monthly income.

4) The administrators in Ministry Of Health should try to organise and conduct health education programs about diabetic retinopathy in simple and familiar language among the community through mass media to raise public awareness and knowledge regarding diabetic retinopathy.

5) Encourage the diabetic patients to talk about diabetic retinopathy with their doctors.

6) Further nation-wide studies on assessment of diabetic patients' knowledge regarding diabetic retinopathy need to be conducted in larger sample size, to identify the level and distribution of different knowledge grades as well as the areas and topics of knowledge deficits.

7) To present the most key points in this study to PHCC doctors in training centres and to write a pamphlet about diabetic retinopathy to be distributed to diabetic patients.

Acknowledgements

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