Knowledge, Attitude and Practice regarding Diabetic Retinopathy Amongst Diabetic Patients in Aseer Region

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Abstract

Background: Diabetic retinopathy (DR) is the most common micro vascular complication of diabetes and the foremost cause of blindness in working-aged people and patients who are aged 55 years or older. It is estimated that up to 84.5% of patients with DM who have had the disease for more than 20 years will develop DR. DR is the leading cause of avoidable visual impairment and blindness worldwide it can affect 24% of diabetic patients who have had the disease for 10–15 years.

Aim: to assess the knowledge, attitude and practice of diabetic retinopathy among the Diabetic Patients in Aseer Region.

Methodology: A descriptive cross-sectional study was conducted between December, 2019 and March, 2020. Data were collected using a structured questionnaire developed in Arabic, which included questions about patients' bio-demographic data, type and duration of diabetes, awareness of DR.

Results: A total sample of 915 participants was included in the study with nearly half of them aged 40 years or more. Exactly 53.6% of the cases were males and 53.2% were married. University level of education was reported among 50.4% of the cases. Exactly 45.4% of the patients reported the normal level of blood glucose level and 76.6% reported that it's important to keep blood glucose level at its normal range. About 50% of the patients agreed that diabetic retinopathy is a curable disorder and 66.1% reported that uncontrolled diabetes is the main cause of progressing DR. Totally, more than half of the patients had good awareness level regarding diabetic retinopathy.

Conclusions & recommendations: In conclusion, the study revealed that the patients' awareness level and practice regarding diabetic retinopathy was intermediate. The patients who were recently diagnosed were more compliant for periodic checkups and had higher awareness level. More effort should be paid to improve patients' awareness regarding diabetes as a chronic health problem and of its related complications.

Key words: Diabetic retinopathy, diabetes, eye complications, awareness, practice, ophthalmic complications, assessment

Background

Diabetic retinopathy (DR) is one of the most recorded microvascular complications of DM affecting the eye (1). The main feature of diabetic retinopathy is disturbance of the retinal circulation which affects retinal blood supply and oxygen supplementation, which diminishes its ability to achieve the needs of its high metabolic demands (2). Therefore, disturbance in retinal circulation may affect normal vision, and subsequently cause vision impairment which may end with complete blindness (3-5). DR is associated with many risk factors among diabetics including uncontrolled DM, longer periods of DM and the presence of other systemic diseases such as hypertension (6, 7).

Diabetic Retinopathy (DR) is recorded as the main cause of blindness that affects 34 million worldwide constituting 4% of blindness cases (8). Diabetic retinopathy affects up to 80 percent of those who have had diabetes for 20 years or more (9). At least 90% of new cases could be reduced with proper treatment and monitoring of the eyes (10). Population awareness regarding diabetes mellitus and its complications is a significant factor for early detection and intervention for complications including diabetic retinopathy, ending with reduction or even improvement of these complications (5). The magnitude of diabetic retinopathy varies widely among diabetic patients which ranged from 27% in India to 67% in the USA (2, 11, 12). Also many patients don't visit the ophthalmologist for routine annual eye examination for controlling DR early which may affect its management (13, 14). All of this indeed will increase the demand for improving population awareness regarding diabetes and its complications to make T2D patients more aware about the nature of the disease and expected complications including ophthalmic complications.

Up to date there are a lack of studies that assess the awareness levels regarding DR among diabetic patients especially type 2 diabetics sufferers in Abha which is the main city in Aseer region. With expected increased incidence of DR, the current study was conducted to assess the awareness levels of diabetic patients regarding DR, compliance with DM control and routine eye check-up among the patients attending the diabetic center in Abha city.

Methodology

A descriptive cross-sectional study was conducted between December, 2019 and March, 2020. Data were collected using structured questionnaire developed in Arabic, which included questions about patients' bio-demographic data, type and duration of diabetes, awareness of DR, periodic checkup frequency, treatment of DR, and patients practice regarding DR. All interviewed patients were type I or type II diabetic and were directly interviewed in the diabetic centers in Aseer region and later on due to coronavirus, they were asked to fill out the questionnaire online as it was uploaded onto social media platforms by the researchers and their friends.

The content validity of the questionnaire was assessed by an expert panel of three anonymous specialists of advanced medical background regarding diabetes. Prior to the study, for the assessment of the reliability of the questionnaire, a random sample of 25 patients with diabetes was included to complete the questionnaire and the obtained Cronbach's alpha value was 0.73.

Data analysis

After data were extracted, it was revised, coded and fed into statistical software IBM SPSS version 22 (SPSS, Inc. Chicago, IL). All statistical analysis was done using two tailed test. P value less than 0.05 was considered to be statistically significant. For awareness items, each correct answer was scored one point and total summation of the discrete scores of the different items was calculated. A patient with a score less than 60% (6 points) of the maximum score was considered to have poor awareness while good awareness was considered if they had score of 60% or more (7 points or more) of the maximum. Descriptive analysis based on frequency and percent distribution was done for all variables including demographic data, awareness items and patients practice. Univariant relations between patients' bio-clinical data and practice with awareness level were done based on Pearson chi-square test.

Results

A total sample of 915 participants was included in the study with nearly half of them aged 40 years or more. Exactly 53.6% of the cases were males and 53.2% were married. University level of education was reported among 50.4% of the cases and monthly income ranging between 5000 to 15000 SR was reported among 43.3% of the cases. Type I diabetes was diagnosed among 28.5% of the patients and type II among 33.8% while 37.7% of the patients did not know about the type of diabetes they have. Diabetes was diagnosed for less than 5 years among 41.9% of the cases and 36.6% were on insulin therapy (Table 1).

Table 2 illustrates the patients awareness regarding DR. Exactly 45.4% of the patients reported a normal level of blood glucose (90-120) and 76.6% reported that it's important to keep blood glucose level at its normal range. Also 75.4% of the patients said that diabetes can affect the eye retina and 65.9% agreed that DR can causes blindness. Diabetes control as a measure to prevent DR was reported by 73.1% of the patients and 63.5% of the patients agreed that diabetic patients may have eye problems at time of diagnosis. About 44% of the patients reported that there is no need for regular diabetic retinopathy assessment if both eyes are good while only 15.4% said that ophthalmic assessment for diabetes should be annual. Exactly 55.7% of the patients agreed that Diabetic retinopathy is a curable disorder and 66.1% reported that uncontrolled diabetes is the main cause of progressing DR. Totally, 57.8% of the patients had good awareness level regarding diabetic retinopathy.

Considering patients practice (Table 3), 55.5% of the patients keep their blood glucose level at its normal range while 69.7% of the patients have undergone ophthalmic assessment by a physician. About 60% of the patients have drugs for diabetes which was prescribed by a physician among 90% of them.

Finally, on relating patients' awareness regarding DR by their bio-clinical data, Table 4 demonstrates that 61.4% of the male patients had good awareness regarding DR compared to 53.6% of the females with a recorded statistical significance (P=.017). Also 60.6% of the single patients had good awareness level compared to 41.8% of separated patients (P=.001). Exactly 56.3% of the patients with low income had good awareness level compared to 49% of those who had high income (P=.003). Also, 68.7% of the patients who had diabetes for less than 5 years had good awareness levels compared to 45.5% of those who were diagnosed for more than 10 years (P=.001). About 72% of the patients who had previously undergone ophthalmic assessment had good awareness level compared to 24.2% of those who did not (P=.001).

Table 1: Bio-clinical data of diabetic patients in Aseer region, Southern Saudi Arabia

Bio-clinical data		No	%
Age in years	< 18 years	37	4.0%
	18-	199	21.7%
	30-	237	25.9%
	40-	308	33.7%
	50+	134	14.6%
Gender	Male	490	53.6%
	Female	425	46.4%
Marital status	Single	246	26.9%
	Married	487	53.2%
	Divorced/ widow	182	19.9%
Educational level	Primary	74	8.1%
	Intermediate	115	12.6%
	Secondary	265	29.0%
	University/ PG	461	50.4%
Monthly income	< 5000 SR	323	35.3%
	5000-15000 SR	396	43.3%
	> 15000 SR	196	21.4%
Type of DM	Don't know	345	37.7%
	Type I DM	261	28.5%
	Type II DM	309	33.8%
Duration of having DM	< 5 years	383	41.9%
	5-10	299	32.7%
	> 10 years	233	25.5%
Insulin therapy	Yes	335	36.6%
	No	215	23.5%
	No treatment at all	365	39.9%

Table 2. Awareness regarding diabetic retinopathy among diabetic patients in Aseer region, Southern Saudi Arabia

DR awareness items		No	%
Normal level of blood glucose	Don't know	139	15.2%
	90-120	415	45.4%
	120-160	175	19.1%
	160-240	117	12.8%
	240-300	69	7.5%
It's important to keep BGL normal	Don't know	109	11.9%
	Yes	701	76.6%
	No	105	11.5%
DM can affect retina	Don't know	118	12.9%
	Yes	690	75.4%
	No	107	11.7%
Diabetic retinopathy can cause blindness	Don't know	179	19.6%
	Yes	603	65.9%
	No	133	14.5%
Diabetic control prevents retinopathy	Don't know	128	14.0%
	Yes	669	73.1%
	No	118	12.9%
Diabetic patient may had eye problems at diagnosis time	Don't know	208	22.7%
	Yes	581	63.5%
	No	126	13.8%
No need for regular diabetic retinopathy assessment if both eyes are good	Don't know	163	17.8%
	Yes	401	43.8%
	No	351	38.4%
Frequency of ophthalmic investigation	Don't know	94	10.3%
	At diagnosis time	75	8.2%
	Every 6 months	362	39.6%
	Annually	141	15.4%
	Every 2 years	75	8.2%
	After 5 years	31	3.4%
	If had eye complaint	137	15.0%
Checking eyes at ophthalmology technician is enough	Don't know	129	14.1%
	Yes	317	34.6%
	No	469	51.3%
Diabetic retinopathy is curable disorder	Don't know	253	27.7%
	Yes	510	55.7%
	No	152	16.6%
Causes of progressed diabetic retinopathy	Don't know	160	17.5%
	Uncontrolled diabetes	605	66.1%
	HTN	311	34.0%
	Renal disorder	208	22.7%
	Anaemia	100	10.9%
Overall awareness	Poor	386	42.2%
	Good	529	57.8%

Table 3: Clinical Practice among patients with diabetes in Aseer region, Southern Saudi Arabia

Practice	No	%
Keep your BGL within normal		
Not sure	194	21.2%
Yes	508	55.5%
No	213	23.3%
Previously undergone ophthalmic assessment		
Yes	638	69.7%
No	277	30.3%
Use diabetic drugs		
Yes	550	60.1%
No	365	39.9%
If yes, is it prescribed by physician		
Yes	495	90.0%
No	55	10.0%

Table 4. Distribution of patients' awareness level regarding DR according to their bio-clinical data and practice

Factors		Knowledge level				P-value
		Poor		Good		
		No	%	No	%	
Age in years	< 18 years	15	40.5%	22	59.5%	.105
	18-	68	34.2%	131	65.8%	
	30-	109	46.0%	128	54.0%	
	40-	132	42.9%	176	57.1%	
	50+	62	46.3%	72	53.7%	
Gender	Male	189	38.6%	301	61.4%	.017*
	Female	197	46.4%	228	53.6%	
Marital status	Single	97	39.4%	149	60.6%	.001*
	Married	183	37.6%	304	62.4%	
	Divorced/ widow	106	58.2%	76	41.8%	
Educational level	Primary	32	43.2%	42	56.8%	.766
	Intermediate	53	46.1%	62	53.9%	
	Secondary	113	42.6%	152	57.4%	
	University/ PG	188	40.8%	273	59.2%	
Monthly income	< 5000 SR	141	43.7%	182	56.3%	.003*
	5000-15000 SR	145	36.6%	251	63.4%	
	> 15000 SR	100	51.0%	96	49.0%	
Type of DM	Don't know	130	37.7%	215	62.3%	.089
	Type I DM	120	46.0%	141	54.0%	
	Type II DM	136	44.0%	173	56.0%	
Duration of having DM	< 5 years	120	31.3%	263	68.7%	.001*
	5-10	139	46.5%	160	53.5%	
	> 10 years	127	54.5%	106	45.5%	
Previously undergone ophthalmic assessment	Yes	176	27.6%	462	72.4%	.001*
	No	210	75.8%	67	24.2%	
Use diabetic drugs	Yes	192	34.9%	358	65.1%	001*
	No	194	53.2%	171	46.8%	

P: Pearson X^2 test
* P < 0.05 (significant)

Discussion

Diabetes mellitus (DM) is a systemic disease characterized by a chronic high blood glucose level (15). Diabetes mellitus is a multifactorial disorder that affects 46% of men and 44% of females in the above "50 years old" age group in Saudi Arabia (16). World Health Organization (WHO) has ranked Saudi Arabia as having the second highest rate of diabetes in the Middle East (7th highest in the world) with an estimated population of 7 million living with diabetes (17). DM has many complications, including cardiovascular disease, neuropathy, nephropathy, and diabetic retinopathy (DR) (18).

Diabetic retinopathy (DR) is the most recorded microvascular complication of diabetes and the leading cause of blindness in old aged patients who are 55 years or older (19). Diabetic retinopathy may affect up to 85% of patients with DM who have had the disease for more than 20 years (19, 20). In Saudi Arabia, the prevalence for DR ranged from 28% to 36% of the diabetic patients according to different studies in different areas of the country (21-23). The majority of DR patients present in late stages due to the silent nature of the disease. If diabetic patients are aware of the disease nature and its related complications besides the importance of periodic comprehensive checkup including ophthalmic assessment, this will help in early detection of any complication and early intervention which will minimize the magnitude and burden of these complications.

The current study aimed to assess the diabetic patients' awareness and practice regarding DR in Aseer region. The study revealed that nearly two thirds of the patients had a good awareness level regarding diabetic retinopathy. The highest area of awareness included the triggering factors for having DR among diabetic patients especially the importance of controlling the blood glucose level. The frequency of undergoing ophthalmic assessment was poorly identified by the patients as nearly 1 out of each 8 patients gave the correct frequency. The most surprising finding regardless the good awareness was that nearly one third of the patients were not aware of the type of diabetes they have besides they don't have any treatment at all irrespective of that the majority of the sample being highly educated which needs further case studies and explanation. This may be explained by that they are high normal or pre-diabetic cases and need only dietary control and periodic follow-up. The second interesting finding was that the high awareness level regarding DR was associated with single patients with low income level but not related with the patients' level of education. Other significant determinants for the patients' awareness level were those who had the disease recently (less than 5 years) and this means that they are still caring about the disease and afraid of having the complications. Also, patients who had their therapy regularly plus those who had undergone ophthalmic checkup had higher awareness which may be achieved through their physician during the follow-up visits.

Regarding patients' practice, more than half of the cases are adherent to the management plan and keep their blood glucose level within its normal range. Also more than two thirds of the cases have undergone ophthalmic assessment by their physicians but only 60% receive medication. This also may strengthen the assumption of some that these included cases are not true diabetic but borderline and need continuous assessment with no need for medication.

A study was conducted in Jeddah to assess Awareness of diabetic retinopathy among people with diabetes, in 2018 by Alzahrani SH et al. (24). The study revealed that about 82.6% of the patients were aware that DM can affect their eyes. Also, nearly 36% of the patients reported that their doctors had not advised them about it. More than half responded that they did not feel their vision to be affected by DM. More than 58% had never been diagnosed with DR. About 35% did not go to their eye checkups, even though around 59% thought that DR could lead to blindness. A second study was conducted at a private hospital of Riyadh, Saudi Arabia to determine knowledge, attitude and practice regarding diabetic retinopathy screening and its management among diabetic patients (25). The researchers reported that two hundred participants were interviewed, half from the endocrinology unit and half from the eye clinic. High awareness of the ophthalmic effects of diabetes was noted in 45.5% of participants. Thirty-eight (19%) of the patients had a positive attitude. None had an acceptable level of practice and poor practice was noted in 74% of the participants. Longer duration of DM (P=0.07) and systemic complications (P=0.06) were associated with good knowledge.

Understanding the level of public awareness of a disease condition helps educators to plan a future program that increases the level of knowledge in the diagnosis, complications, and management of patients. There are few studies on DR that have been published from various cities across Saudi Arabia among diabetic patients.

Conclusion and Recommendations

In conclusion, the study revealed that the patients' awareness level and practice regarding diabetic retinopathy was intermediate, not poor and not high. The patients who were recently diagnosed were more compliant for periodic checkup and had higher awareness level. More effort should be paid to improve patients' awareness regarding diabetes as a chronic health problem and its related complications through health education sessions in primary health care centers and through social media which is present in all homes in the country. Periodic Screening for diabetic patients to assess silent complications including DR is mandatory to help in early detection and management.

References

1. Alberti KG, Zimmet PZ. Definition, diagnosis and classification of diabetes mellitus and its complications. Part 1: diagnosis and classification of diabetes mellitus provisional report of a WHO consultation. Diabet Med. 1998; 15(7):539–553.
2. Tajunisah I, Wong P, Tan L, Rokiah P, Reddy S. Awareness of eye complications and prevalence of retinopathy in the first visit to eye clinic among type 2 diabetic patients. Int J Ophthalmol. 2011; 4(5):519–524.
3. Nsiah-Kumi P, Ortmeier SR, Brown AE. Disparities in diabetic retinopathy screening and disease for racial and ethnic minority populations – a literature review. J Natl Med Assoc. 2009; 101(5):430–437.
4. Wong TY, Cheung N, Tay WT, et al. Prevalence and risk factors for diabetic retinopathy: The Singapore Malay Eye Study. Ophthalmology. 2008; 115(11):1869–1875.
5. Chatziralli IP, Sergentanis TN, Keryttopoulos P, Vatkalis N, Agorastos A, Papazisis L. Risk factors associated with diabetic retinopathy in patients with diabetes mellitus type 2. BMC Res Notes. 2010; 3:153.
6. Liu L, Wu J, Yue S, et al. Incidence density and risk factors of diabetic retinopathy within type 2 diabetes: a five-year cohort study in China (Report 1) Int J Environ Res Public Health. 2015; 12(7):7899–7909.
7. Zhang X, Saaddine JB, Chou CF, et al. Prevalence of diabetic retinopathy in the United States, 2005–2008. JAMA. 2010; 304(6):649–656.
8. Tapp RJ; Shaw JE; Harper CA; et al. (June 2003). "The prevalence of and factors associated with diabetic retinopathy in the Australian population". Diabetes Care. 26 (6): 1731–7.
9. Kertes PJ, Johnson TM, eds. (2007). Evidence Based Eye Care. Philadelphia, PA: Lippincott Williams & Wilkins. ISBN 0-7817-6964-7.
10. Xu, Heping; Curtis, Timothy; Stitt, Alan. "Pathophysiology and Pathogenesis of Diabetic Retinopathy. Diapedia 2013. 7104343513 (14).
11. Livingston PM, Wood CA, McCarty CA, Harper CA, Keeffe JE, Taylor HR. Awareness of diabetic retinopathy among people who attended a diabetic retinopathy screening program. Med J Aust. 1998; 169(2):117.
12. Hussain R, Rajesh B, Giridhar A, et al. Knowledge and awareness about diabetes mellitus and diabetic retinopathy in suburban population of a South Indian state and its practice among the patients with diabetes mellitus: A population-based study. Indian J Ophthalmol. 2016; 64(4):272–276.
13. Lin S, Ramulu P, Lamoureux EL, et al. Addressing risk factors, screening, and preventative treatment for diabetic retinopathy in developing countries: a review. ClinExpOphthalmol 2016; 44:300–20.
14. Wang D, Ding X, He M, et al. Use of eye care services among diabetic patients in urban and rural China. Ophthalmology 2010; 117:1755–62.
15. American Diabetes Association. Diagnosis and classification of diabetes mellitus. Diabetes care. 2014 Jan 1; 37(Supplement 1):S81-90.
16. Alotaibi A, Perry L, Gholizadeh L, Al-Ganmi A. Incidence and prevalence rates of diabetes mellitus in Saudi Arabia: An overview. Journal of epidemiology and global health. 2017 Dec 1; 7(4):211-8.
17. Alwin Robert A, Abdulaziz Al Dawish M, Braham R, Ali Musallam M, Abdullah Al Hayek A, Hazza Al Kahtany N. Type 2 diabetes mellitus in Saudi Arabia: major challenges and possible solutions. Current diabetes reviews. 2017 Feb 1; 13(1):59-64.
18. Zheng Y, Ley SH, Hu FB. Global aetiology and epidemiology of type 2 diabetes mellitus and its complications. Nature Reviews Endocrinology. 2018 Feb; 14(2):88.
19. Duh EJ, Sun JK, Stitt AW. Diabetic retinopathy: current understanding, mechanisms, and treatment strategies. JCI insight. 2017 Jul 20; 2(14).
20. Ting DS, Cheung GC, Wong TY. Diabetic retinopathy: global prevalence, major risk factors, screening practices and public health challenges: a review. Clinical & experimental ophthalmology. 2016 May; 44(4):260-77.
21. Ahmed RA, Khalil SN, Al-Qahtani MA. Diabetic retinopathy and the associated risk factors in diabetes type 2 patients in Abha, Saudi Arabia. Journal of family & community medicine. 2016 Jan; 23(1):18.
22. Alshaya AK, Alsayegh AK, Alshaya HK, Almutlaq BA, Alenazi NS, Al Rasheedi HM, Albaqawi SK, Alshammari NK, Hassan AO, Ahmed HG. The common complications and comorbidities among Saudi diabetic patients in Northern Saudi Arabia. Open Journal of Endocrine and Metabolic Diseases. 2017 Jul 26; 7(07):151.
23. Aljehani MM, Mohamed AM, Ali AH, Alhaeti HR, Alribh FM, Alharbi FA, Alassiri KM, Abolihyh AM, Alghamdi OA, Al-Hassan FJ. Prevalence of Diabetic Complications in Relation to Risk Factors among Patients with Type 2 Diabetes at University Hospital in Riyadh, Saudi Arabia. EC Endocrinology and Metabolic Research. 2020 Jan 6; 5(2):01-8.
24. Alzahrani SH, Bakarman MA, Alqahtani SM, Alqahtani MS, Butt NS, Salawati EM, Alkatheri A, Malik AA, Saad K. Awareness of diabetic retinopathy among people with diabetes in Jeddah, Saudi Arabia. Therapeutic advances in endocrinology and metabolism. 2018 Apr; 9(4):103-12.
25. Al-Asbali T, Aldawari SA, Alzahim IA, Alalawi H, Khandekar R, Lotfy NM. Knowledge, attitude and practice regarding diabetic retinopathy screening and its management among diabetic patients at a private hospital of Riyadh, Saudi Arabia. Saudi Journal of Ophthalmology. 2019 Dec 31.