

ORIGINAL RESEARCH

Knowledge And Perception About Diabetic Retinopathy In Ischemic Heart Disease In Practicing Physicians -An Original Research

¹Dr Kirthi Raj, ²Dr. Vishal Bhalerao, ³Dr. Kanniyam Binub, ⁴Dr. Anil Managutti, ⁵Dr. Heena Dixit Tiwari, ⁶Dr. Rahul VC Tiwari

¹Assistant Professor, Department of Ophthalmology, Dr B. R. Ambedkar Medical College, Kadugondanahalli, Bangalore, Karnataka, India

²Assistant Professor, Department of Medicine, MIMSR Medical College, Latur, Maharashtra, India

³Associate Professor, Department of Community Medicine, Malabar Medical College, Ulliyeri, Calicut, Kerala, India

⁴Prof.& HOD, Dept of OMFS, Narsinhbhai Patel Dental College and Hospital, Sankalchand Patel University, Visnagar, Gujarat, India

⁵Final year Student, Master of Public Health, Parul University, Limda, Waghodia, Vadodara, Gujarat, India

⁶Executive MHA Student, IIHMR University, Jaipur, Rajasthan, India

Correspondence:

Dr. Kanniyam Binub

Associate Professor, Department of Community Medicine, Malabar Medical College, Ulliyeri, Calicut, Kerala, India

Email: kanniyambinub@gmail.com

ABSTRACT

Aim: The purpose of the present research was to assess the knowledge as well as perception amongst various practicing physicians about diabetic retinopathy in ischemic heart disease patients.

Methodology: A cross-sectional study was designed to assess the knowledge, perception amongst 209 practicing physicians. A self-administered questionnaire about demographic and professional data, knowledge regarding Diabetic retinopathy (DR), and about attitudes and practices toward DR screening and management in Cardiovascular disease (CVD) patients were distributed amongst participants. Descriptive statistical analysis was conducted for the data obtained from the present survey.

Results: A total of 141 physicians completed the questionnaire for a response rate of 67%. Nevertheless, only 36.9% taught their patients about how to detect complications early in CVD patients. The overall mean knowledge score was 1.23 ± 0.67 for males and 1.98 ± 1.11 for females $p = 0.260$.

Conclusion: It is important for DR to be detected in a timely manner in CVD patients by the physicians that will allow early treatment and prevention of visual loss.

Keywords: diabetic retinopathy; cardiovascular disease

INTRODUCTION

Diabetes is the most common chronic disease related to metabolic and endocrine impairment.^{1,2} About 382 million people are affected by diabetes and, every minute, about 10 people die from its complications.² Long-term duration of diabetes, poor control of blood glucose, and genetic basis are possible risk factors for the development of microvascular complications of diabetes, including diabetic retinopathy (DR).^{3,4} DR is one of the most common complications of diabetes and the leading cause of blindness in the productive age range.⁵ Seventy-eight percent to 97% of type 1 diabetes patients and 60% to 80% of type 2 diabetes patients will develop some degree of DR after more than 15 years with the disease.⁶ Although the rate of blindness due to DR is high, early detection, the application of effective screening programs, and efforts to control the risk factors for DR are crucial to delay the onset and slow the progression of the condition.⁷ According to the American Academy of Ophthalmology guidelines, immediate evaluation of DR in type 2 diabetes patients at the time of diagnosis and annually thereafter should occur.⁸ On the other hand, in type 1 patients, ophthalmoscopy screening is initiated beginning at five years after diagnosis and annually from then.⁹ A study performed in Riyadh found that 71% of physicians referred type 2 diabetes patients to an ophthalmologist correctly, while only 24% of physicians did a correct referral for type 1 diabetes patients.¹⁰ Additionally, when patients with diabetes develop CVD, they have a higher mortality rate than Cardiovascular disease (CVD) patients without diabetes.¹¹ At least 68% of people >65 years of age with DM die of some form of heart disease and 16% die of stroke. Heart disease death rates among adults with DM are two to four times higher than the rates for adults without DM.¹² Controlling blood glucose levels and cardiovascular preventive treatment are essential to reduce CVD complications of diabetes.¹³ CVD is the leading cause of death among men, and diabetes is a major risk factor for CVD in both men and women.¹⁴ The risk of developing CVD is greatly elevated in patients with type 2 diabetes compared with the general population.¹⁵ Type 2 diabetes is the most common form of diabetes that most often occurs after the age of 40. The CVD that might accompany diabetes includes angina, myocardial infarction (heart attack), stroke, peripheral artery disease and congestive heart failure. Several published studies examining the relationship between diabetes and CVD have emphasized the significance of controlling diabetes through screening, management and patients' education. Furthermore, the literature contends that there is still lack of awareness among patients with diabetes about their high risk to CVD and diabetes self-management support. A survey of people with type 2 diabetes in the Middle East and North Africa found that most participants had knowledge of CVD and its risk factors, but most of them were not aware of their high risk for these diseases as a complication of diabetes. Additionally, most of them reported not being informed about CVD risks by their healthcare providers. Health-related risk perception is defined as a subjective assessment of the susceptibility of a person to a threat. It is central to health behaviours that highly influence self-management in long-term illnesses. Health risk perception takes into account three factors: knowledge about the risk, personal meaning of risk and preventive

management of risk. Understanding the patients' perceptions of prevention and management highly influences self-management and adoption of healthy behaviours. Studies agree that interventions targeting changing health risk perception improve health behavioural outcomes.^{15,16} Learning how diabetes is represented to patients and uncovering their beliefs and cognition about the disease and disease control provide opportunities for healthcare providers to enhance their healthcare management.

AIM OF THE PRESENT STUDY

The purpose of the present research was to assess the knowledge as well as perception amongst various practicing physicians about diabetic retinopathy in ischemic heart disease patients.

METHODOLOGY

A prospective cross-sectional study was designed to assess the knowledge, perception amongst practicing physicians. With a precision of 5% at a 95% confidence level, the calculated sample size was 209 physicians. The participants of the study were randomly selected according to lists provided from the health sectors. A self-administered questionnaire in the English language was given to every participant through e-mails. The questionnaire consisted of three sections and a total of 18 questions, with seven questions being about demographic and professional data, four questions being about knowledge regarding DR, and seven questions being about attitudes and practices toward DR screening and management in CVD patients, respectively. The responses were entered in an Microsoft excel spreadsheet and subjected to analysis. Statistical analysis was carried out by using the Statistical Package for the Social Sciences version 21 software Program. Descriptive statistics for all variables were performed, including means, medians, interquartile ranges, and standard deviations (SDs). An inferential analysis was conducted to detect the association among different study variables. Analysis of variance (t-test) was used to detect the differences in mean score between different subgroups stratified according to gender, age, medical specialty, and primary health sector. A p-value of less than 0.05 was set as a statistically significant result.

RESULTS

The analysis of the data revealed three themes representing illness perceptions: (a) Perception of diabetes control; (b) Perception of cardiovascular disease risk; (c) Coping with disease-imposed limitations. A total of 141 physicians completed the questionnaire for a response rate of 67%. Eighty-seven (61.7%) of these were male, while 54 (38.3%) were female. Mean age was 33.0142 years (SD: 6.8889 years, range: 25-58 years). Years of medical practice ranged from less than one year to 25 years, with a mean of 5.5674 years (SD: 5.39120 years). (Table 1)

Table 1- Demographic data of the practicing physicians in the present study

Variable	Category	N	%
Gender	Male	87	61.7%
	Female	54	38.3%

Medical specialty	Family medicine	56	39.7
	Internal medicine	10	7.1
	GP	75	53.2
Age	Below 40 years age	74	59.4
	Above 40 years age	67	40.6
Years of medical practice	Below 10 years	83	69.9
	Above 10 years	58	30.1

With a cut-off of 50% of the ideal score, 56% had good knowledge and 44% had poor knowledge. Most physicians (89.4%) reported instructing their diabetic patients to apply lifestyle modifications (e.g., diet and exercise), 63.8% taught them about the disease itself, and 63.1% educated their patients on the importance and necessity of adhering to the treatment plan and follow-up visits. Nevertheless, only 36.9% taught their patients about how to detect complications early in CVD patients. The overall mean knowledge score was 1.23 ± 0.67 for males and 1.98 ± 1.11 for females $p = 0.260$. (Table 2)

Table 2- Knowledge and scoring regarding DR in CVD cases

Variable	Percentage	Mean \pm SD	P value
Amount of knowledge (overall)	56%	2.3 \pm 0.9	1.3
Good	44%	1.09 \pm 0.7	
Poor			
Amount of knowledge (based on gender)			0.20
Male	48%	1.23 \pm 0.67	
Female	52%	1.98 \pm 1.11	

DISCUSSION

Discussing the long-term effect of diabetes on patients' health, most participants agree it becomes serious if complications such as vision loss, leg amputation and kidney disease occur that physically disable the person or interrupt their daily activities and affect their socioeconomic status, leading to outcomes such as loss of job. The goals of diabetes management are to maintain the normal level of blood glucose, reduce risks, prevent or delay complications, decrease mortality and maintain a good quality of life (American Diabetes Association, 2019). The present study showed no significant difference between males and females in the mean scores of knowledge. Similar findings were reported by Al-Rasheed et al.¹⁷ Furthermore, it also found no significant difference in the mean knowledge score upon comparing it among physicians of different age groups and years of medical practice since graduation. There is a strong epidemiological correlation between hypertension caused by

diabetes and the adverse consequences of diabetes. The epidemiological study from the UK Prospective Diabetes Study (UKPDS) suggests that with a decrease in the mean systolic pressure of 10 mmHg, the risk of any diabetes-related complication decreases by 12%, the risk of death from diabetes decreases by 15%, the risk of myocardial infarction decreases by 11% and the risk of a microvascular complication decreases by 13%. Do et al.'s¹⁸ study also finds that lowering blood pressure is effective in preventing DR for 4–5 years. Tada et al.'s¹⁹ most recent findings also explain the correlation between triglycerides in serum and the first occurrence of CVD in diabetic patients with a high risk of hypercholesterolemia and retinopathy. In Cheung et al.'s study on DR and coronary artery disease, 214 (14.7%) of the participants were diagnosed with DR. A follow-up examination of an average of 7–8 years showed that 209 (13.7%) of the patients were diagnosed with coronary artery disease.²⁰ Several major epidemiological studies have agreed on a correlation between the factors in systemic disease and the calibre of the retinal blood vessels. It has been particularly confirmed that an increase in systemic blood pressure is reflected in systemic arterial vasoconstriction of the retinal blood vessels.²¹ The primary systemic determinant of a narrower calibre of retinal arteriole is higher blood pressure whereas those of a broader calibre of retinal venule include smoking, hypertension, systemic inflammation and obesity.²² In other words, there is increasing evidence to suggest that the diameter of a retinal blood vessel carries information on not only retinal circulation but also systemic pathological changes. Hence, the physicians have a crucial role in the early detection and prevention of DR. Regarding these physicians' knowledge, the present study concluded that there are gaps in applying the correct guidelines.

CONCLUSION

Health practitioners must implement effective methods of helping patients to translate their knowledge into appropriate practices. It is important for DR to be detected in a timely manner in CVD patients by the physicians that will allow early treatment and prevention of visual loss.

REFERENCES

1. Aljabri K, Bokhari S, Alqurashi K. Prevalence of diabetes mel litus in a Saudi community. *Ann Saudi Med* 2011;31:19.
2. Aguiree F, Brown A, Cho NH, Dahlquist G, Dodd S, Dunning T, Hirst M, Hwang C, Magliano D, Patterson C, Scott C. *IDF diabetes atlas*. 6th ed. International Diabetes Federation 2013,pp. 29-35.
3. Balasuriya B, Sumanatilleke M, Jayasekera T, Wijesuriya M, Somasundaram N. Prevalence of micro and macrovascular complications of diabetes detected at single visit screening. *Sri Lanka Journal of Diabetes Endocrinology and Metabolism* 2012;2:17-20. <https://doi.org/10.4038/sjdem.v2i1.4328>

4. Maghbooli Z, Pasalar P, Keshtkar A, Farzadfar F, Larijani B. Predictive factors of diabetic complications: a possible link between family history of diabetes and diabetic retinopathy. *Diabetes Metab Disord* 2014;13:55.
5. Ahmed R, Khalil S, Al-Qahtani M. Diabetic retinopathy and the associated risk factors in diabetes type 2 patients in Abha, Saudi Arabia. *J Fam Community Med* 2016;23:18.
6. Chakrabarti R, Harper C, Keeffe J. Diabetic retinopathy management guidelines. Expert review of ophthalmology. 2012;7:417-39.
7. Z. Alotaibi A. A retrospective study of causes of low vision in Saud Arabia, a case of eye world medical complex in Riyadh. *GJHS* 2015;8:205.
8. Al-Rubeaan K, Abu El-Asrar A, Youssef A, Subhani S, Ahmad N, Al-Sharqawi A, Alguwaihes A, Alotaibi M, Al-Ghamdi A, Ibrahim H. Diabetic retinopathy and its risk factors in a society with a type 2 diabetes epidemic: a Saudi National Diabetes Registry-based study. *Acta Ophthalmol* 2014;93:e140-e7.
9. Khan A, Wiseberg J, Lateef Z, Khan S. Prevalence and determinants of diabetic retinopathy in Al Hasa region of Saudi Arabia: primary health care centre based cross-sectional survey, 2007- 2009. *Middle East Afr J Ophthalmol* 2010;17:257.
10. Al Rasheed R, Al Adel F. Diabetic retinopathy: knowledge, awareness and practices of physicians in primary-care centers in Riyadh, Saudi Arabia. *Saudi J Ophthalmol* 2017;31:2-6.
11. Hu, Y. (2019). Advances in reducing cardiovascular risk in the management of patients with type 2 diabetes mellitus. *Chronic Diseases and Translational Medicine*, 5(1), 25–36
12. Go, A. S., Mozaffarian, D., Roger, V. L., Benjamin, E. J., Berry, J. D., Blaha, M., American Heart Association Statistics Committee and Stroke Statistics Subcommittee (2014). Heart disease and stroke statistics— 2014 update: A report from the American heart association. *Circulation*, 129, e28–e292.
13. Ferwana, M., Abdulmajeed, I., Al Madani, W., AlDughaiter, A., Alrowaily, M., Al Bader, B., Al Farhan, A. (2015). Glycemic control and accompanying risk factors: 4-year primary care study. *Journal of Diabetes and Metabolism*, 6(4), 1-9.
14. Zeber, J., & Parchman, M. L. (2010). Cardiovascular disease in type 2 diabetes: Attributable risk due to modifiable risk factors. *Canadian Family Physician*, 56, e302-7.
15. Udell, J. A., Scirica, B. M., Braunwald, E., Raz, I., Steg, G., Davidson, J., ... Bhatt, D. L. (2012). Statin and aspirin therapy for the prevention of cardiovascular events in patients with type 2 diabetes mellitus. *Clinical Cardiology*, 35(12), 722–729.
16. Ferrer, R., & Klein, W. M. (2015). Risk perceptions and health behavior. *Current Opinion in Psychology*, 1(5), 85–89.
17. Wilks R., Younger N., Tulloch Reid M., Mc Farlane, S., & Francis, D. (2008). *Jamaican Health and Lifestyle Survey 2007–2008*.
18. Do, D.V.; Wang, X.; Vedula, S.S.; Marrone, M.; Sleilati, G.; Hawkins, B.S.; Frank, R.N. Blood pressure control for diabetic retinopathy. *Cochrane Database Syst. Rev.* 2015, 1, CD006127.
19. Tada, H.; Kawashiri, M.A.; Nomura, A.; Yoshimura, K.; Itoh, H.; Komuro, I.; Yamagishi, M. Serum triglycerides predict first cardiovascular events in diabetic patients with hypercholesterolemia and retinopathy. *Eur. J. Prev. Cardiol.* 2018, 25, 1852–1860.

20. Cheung, N.; Wang, J.J.; Klein, R.; Couper, D.J.; Sharrett, A.R.; Wong, T.Y. Diabetic retinopathy and the risk of coronary heart disease: The Atherosclerosis Risk in Communities Study. *Diabetes Care* 2007, 30, 1742–1746.
21. Wong, T.Y.; Mitchell, P. The eye in hypertension. *Lancet* 2007, 369, 425–435.
22. Liew, G.; Sharrett, A.R.; Wang, J.J.; Klein, R.; Klein, B.E.; Mitchell, P.; Wong, T.Y. Relative importance of systemic determinants of retinal arteriolar and venular caliber: The atherosclerosis risk in communities study. *Arch. Ophthalmol.* 2008, 126, 1404–1410.