



Original Research Article

Diabetic Retinopathy: Are The General Practitioners Adequately Aware?

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ABSTRACT

Introduction: India is facing an epidemic of diabetes. Diabetic retinopathy is the most common microvascular complication of this disease. With the lack of availability of specialists, the MBBS and the BAMS doctors are the first contact health professionals. They have a significant role to play in screening, generating awareness among their patients about diabetic retinopathy and its complications.

Aims: In this study we tried to assess the knowledge, awareness and attitude of general practitioners practicing modern medicine (MBBS doctors) and indigenous medicine (BAMS doctors) working in the Ludhiana city, Punjab, India.

Materials and methods: This was a questionnaire based cross sectional study involving 51 BAMS and 160 MBBS doctors working in and around Ludhiana city. A questionnaire comprising of twenty two multiple choice questions was filled up by the participants.

Statistical Analysis: The data was entered using an excel sheet and analysed using SPSS software.

Results: The responses of 211 general practitioners, who participated in the CME, were analyzed. Based on the responses given by 51 BAMS doctors, 6 (11.76 %) were graded as excellent, 21 (41.18%) as good, 21 (41.18%) as poor and 3 (5.88%) as very poor. Among the responses given by 160 MBBS doctors, 30 (18.75%) were graded as excellent, 90(56.25%) as good, 36(22.5%) as poor and 4 (2.5%) as very poor.

Conclusion: Continuing medical education and regular training programs to update knowledge of general practitioners is recommended to improve the ocular health outcomes in diabetic patients.

Key Words: Diabetic retinopathy, Awareness, General practitioners.

INTRODUCTION

India is facing an epidemic of diabetes. With 62 million individuals diagnosed with the disease, currently India has the highest number of diabetics in the world. [1] The prevalence of diabetes is predicted to double globally from 171 million in 2000 to 366 million in 2030 with a maximum increase in India. This number is predicted to reach 79.4 million by the year 2030. [2]

Diabetes is associated with microvascular and macrovascular complications which develop gradually but can eventually be disabling and even life threatening. Diabetic retinopathy is the most common microvascular complication of this disease. The prevalence of diabetic retinopathy in patients with diabetes was recently estimated to be around 33.9%. It is responsible for visual impairment in more than 86% of type 1 diabetic patients and in 33% of type 2 diabetic patients. [3] Over the

last 20 years, diabetic retinopathy has emerged as a common cause of ocular morbidity and blindness in India, moving up from number 17 (1986-1989 WHO-NPCB Survey, Government of India) to number 6 (2001–2002 NPCB national survey) in the list of causes of blindness. [4] Duration of diabetes and the severity of hyperglycemia are the major risk factors for development of diabetic retinopathy. It has been seen that nearly all type 1 diabetic patients and 75% of type 2 diabetic patients develop diabetic retinopathy within 15 to 20 years of being diagnosed as having diabetes mellitus. [3] Thus with an increase in the life expectancy, the morbidity due to diabetic retinopathy is going to reach enormous levels in the coming years.

Current treatment modalities of diabetic retinopathy can reduce severe vision loss by 90% if treatment is provided at appropriate time. Treatment can arrest the progression but cannot restore lost vision. Thus early detection and timely intervention is of utmost importance to reduce the burden of visual impairment due to diabetic retinopathy. Fortunately, screening methods can detect diabetic retinopathy in its early stages. Yet half of the people with diabetes are unaware that they have the disease and one third of diabetics never undergo eye examination. [4] The major hindrance in controlling vision threatening complications of diabetic retinopathy is the lack of awareness on the part of the patient and also the treating physician.

Majority of the diabetic patients visit the general practitioners for the treatment of their medical and even visual problems. Especially in villages, with the lack of availability of specialists, the MBBS (Bachelor of Medicine and Bachelor of Surgery) and the BAMS (Bachelor of Ayurvedic Medical Sciences) doctors are the first contact health professionals. They have a significant role to play in generating

awareness among their patients about diabetic retinopathy and its complications. It is also important that they themselves are adequately aware regarding referral of patients at the appropriate time to trained ophthalmologist for ocular examination. In this study we tried to assess the knowledge, awareness and attitude of general practitioners practicing modern medicine (MBBS doctors) and indigenous medicine (BAMS doctors) working in the Ludhiana city, Punjab, India.

MATERIALS AND METHODS

This was a questionnaire based cross sectional study involving BAMS and MBBS doctors working in and around Ludhiana city. We conducted a Continuing Medical Education (CME) program on diabetes and diabetic retinopathy for BAMS and MBBS doctors in our hospital. A total of 51 BAMS and 160 MBBS doctors participated in the CME. All the participants were included in the study. Informed consent was taken and confidentiality of subjects was maintained. Our hospital ethics committee approved the study. A pretested questionnaire was filled up by the participants at the commencement of the CME. The questionnaire comprised of twenty two multiple choice questions covering three sections: epidemiology (question 1-3), risk factors (question 4-12) and management (question 13-22) of diabetic retinopathy. To calculate the overall response of the participants the correct answers were graded in the following way: 16-20 correct answers = excellent, 11-15 correct answers = good, 6-10 correct answers = poor, 0-5 correct answers = very poor.

Statistical analysis: The data was entered using an excel sheet and analysed using SPSS software.

RESULTS

The responses of 211 general practitioners comprising of 51 BAMS and

160 MBBS doctors, who participated in the CME, were analysed. Based on the responses given by 51 BAMS doctors, 6 (11.76 %) were graded as excellent, 21 (41.18%) as good, 21 (41.18%) as poor and 3 (5.88%) as very poor. Among the responses given by 160 MBBS doctors, 30 (18.75%) were graded as excellent, 90(56.25%) as good, 36(22.5%) as poor and 4 (2.5%) as very poor. Table 1 shows the distribution of grades according to overall responses among the two groups. Figure 1

shows poor responses in 47% of BAMS doctors and 25% of MBBS doctors, signifying lack of awareness among general practitioners.

Table 1: Distribution of grades according to overall responses among the two groups.

Grades	Bams	Mbbs
Excellent (16-20)	06 (11.76%)	30 (18.75%)
Good (11-15)	21 (41.18%)	90 (56.25%)
Poor (6-10)	21 (41.18%)	36 (22.5%)
Very poor (0-5)	03 (5.88%)	04 (2.5%)
Total	51	160

Table 2: Distribution of responses in different sections of the questionnaire among the two groups

SECTIONS	BAMS (Total=51)		MBBS (Total=160)	
	Correct responses	Incorrect responses	Correct responses	Incorrect responses
Epidemiology	31 (60.78%)	20 (39.21%)	107 (66.87%)	53 (33.13%)
Risk factors	27 (52.94%)	24 (47.06%)	103 (64.37%)	57 (35.63%)
Management	28 (54.91%)	23 (45.09%)	96 (60%)	64 (40%)

Table 2 shows the distribution of responses among both the groups according to the knowledge in different sections of the questionnaire. In the section on epidemiology of diabetes and diabetic retinopathy, 39.21% of BAMS and 33.13% of MBBS doctors gave incorrect responses. In the section on the risk factors for diabetic retinopathy, incorrect responses were given by 47.06% of BAMS and 35.63% of MBBS doctors. In the section on management, 45.09% of BAMS and 40.00% of BAMS doctors gave incorrect responses.

According to 68.6% BAMS doctors and 82.5% MBBS doctors, diabetic retinopathy is the most common ocular complication of diabetes whereas 31.4% BAMS doctors and 17.5% MBBS doctors thought otherwise. When asked whether they expected >10 out of 100 diabetics to have diabetic retinopathy, only 35.3% BAMS doctors and 42.5% MBBS doctors answered correctly.

Only 25.5% BAMS and 48.8% MBBS doctors knew that duration of diabetes is the most important risk factor for diabetic retinopathy whereas 74.5 % BAMS and 51.2% MBBS doctors gave incorrect

answer. On being asked about the various risk factors for diabetic retinopathy, 35.3% BAMS and 46.3% MBBS doctors answered correctly that pregnancy is a risk factor whereas 64.7% BAMS and 53.8% MBBS doctors thought its not. On being asked if anemia is a risk factor for diabetic retinopathy, 41.2% BAMS and 44.4% MBBS doctors answered correctly and 58.8% BAMS and 55.6% MBBS doctors answered incorrectly. When considering myopia as a risk factor, 58.8% BAMS and 65% MBBS doctors gave incorrect response whereas 41.2% BAMS and 35% MBBS doctors gave correct answer. Hyperlipidemia was considered a risk factor by 54.9% BAMS and 85.6% MBBS doctors whereas 45.1% BAMS and 14.4% MBBS doctors answered incorrectly. When asked if hypertension was considered a risk factor, 82.4% BAMS and 86.3% MBBS doctors answered correctly, on the other hand 17.6% BAMS and 13.7% MBBS doctors answered incorrectly. For renal disease, 60.8% BAMS and 70% MBBS doctors correctly knew that it is a risk factor for developing diabetic retinopathy, on the contrary 39.2% BAMS and 30% MBBS doctors did not think so.

A large number of BAMS (52.9%) and MBBS (44.4%) doctors disagreed with the statement that all patients of diabetes will develop diabetic retinopathy at some point of time, which is again an incorrect response. The fact that strict control of blood sugar slows down progression of diabetic retinopathy was known to 49% BAMS and 58.1% MBBS doctors only, the rest (51% BAMS and 41.9% MBBS doctors) answered incorrectly. About 80.4% BAMS and 58.7% MBBS doctors routinely informed their diabetic patients about the risk of retinopathy whereas 19.6% BAMS and 41.3% MBBS doctors never or occasionally informed their patients about the risk. According to 68.6% BAMS and 88.8% MBBS doctors, fundus examination was required in all diabetics while 31.4% BAMS and 11.2% MBBS doctors did not think so.

On being asked about the time when fundus examination is required in type II diabetics, 58.8% BAMS and 66.2% MBBS doctors knew that it should be done immediately on diagnosis while 35.3% BAMS and 11.2% MBBS doctors thought it should be done only when patients complaint of decreased vision, 2% BAMS and 18.8% MBBS thought it should be done after 5 years and 3.9% BAMS and 3.8% MBBS doctors did not respond. In type I diabetics, only 11.8% BAMS and 15% MBBS doctors thought fundus examination should be done after 5 years of diagnosis while 25.5% BAMS and 13.1% MBBS doctors thought it should be done only when the patients complaint of decreased vision, 60.7% BAMS and 68.1% MBBS doctors

thought it should be done immediately and 2% BAMS and 3.8% MBBS doctors did not respond.

A total of 49% BAMS and 61.3% MBBS doctors carried out fundus examination routinely for their patients or referred them to an ophthalmologist whereas 45.1% BAMS and 26.8% MBBS doctors conducted fundus examination or referred their patients to an ophthalmologist only when patients complained of blurring of vision. However 4.4% MBBS doctors never evaluated fundus or referred their patients and 5.9% BAMS and 7.5% MBBS doctors did not respond. After referring a patient to an ophthalmologist, 60.7% BAMS and 61.9% MBBS doctors routinely inquired about their eye examination on subsequent visit, 25.5% BAMS and 21.8% MBBS doctors occasionally inquired about the same and 13.8% BAMS and 9.3% MBBS doctors never inquired.

On being asked if diabetic retinopathy can be treated or not, 60.7% BAMS and 66.9% MBBS answered correctly, on the contrary 39.3% BAMS and 33.1% MBBS doctors thought it cannot be treated. According to 52.9% BAMS and 62.5% MBBS doctors, laser was considered as the treatment option for diabetic retinopathy while 9.8% BAMS and 10.7% MBBS doctors thought incorrectly that diabetic retinopathy was treated with eye drops. A large number of BAMS (37.3%) and MBBS (26.8%) did not know about the treatment modality of diabetic retinopathy. (Table 3 shows the detailed question wise responses of BAMS and MBBS doctors)

Table 3: Responses of BAMS and MBBS doctors to the questionnaire
Section 1: Based on Epidemiology

Q.No	Questions	BAMS		MBBS	
		Yes	No	Yes	No
1.	Whether India has largest number of diabetics	41(80.4%)	10(19.6%)	120 (75%)	40 (25%)
2.	Commonest ocular complication of diabetes is diabetic retinopathy	35(68.6%)	16(31.4%)	132(82.5%)	28(17.5%)
3.	How often do you expect retinopathy in diabetes patients (>10 patients out of 100)	18 (35.3%)	33 (64.7%)	68 (42.5%)	92 (57.5%)

Section 2: Based on Risk Factors

Q.No	Questions	BAMS		MBBS	
		Yes	No	Yes	No
4.	Most important risk factor for diabetes is duration	13(25.5%)	38(74.5%)	78(48.8%)	82(51.2%)
5.	Pregnancy is a risk factor for diabetic retinopathy	18(35.3%)	33(64.7%)	74(46.3%)	86(53.7%)
6.	Anemia is a risk factor for diabetic retinopathy	21 (41.2%)	30 (58.8%)	71 (44.4%)	89 (55.6%)
7.	Myopia is a risk factor for diabetic retinopathy	30 (58.8%)	21(41.2%)	104 (65%)	56(35%)
8.	Hyperlipidemia is a risk factor for diabetic retinopathy	28 (54.9%)	23 (45.1%)	137(85.6%)	23 (14.4%)
9.	Hypertension is a risk factor for diabetic retinopathy	42 (82.4%)	09(17.6%)	138(86.3%)	22 (13.7%)
10.	Renal disease is a risk factor for diabetic retinopathy	31 (60.8%)	20 (39.2%)	112 (70%)	48 (30%)
11.	All diabetes mellitus patient will develop diabetic retinopathy at some point of time	24 (47.1%)	27(52.9%)	89(55.6%)	71(44.4%)
12.	Strict control of blood sugar slows down progression of diabetic retinopathy	25 (49%)	26 (51%)	93(58.1%)	67(41.9%)

Section 3- Based on Management

Q. No	Questions	Options	BAMS	MBBS
13.	How often do you inform your diabetic patients about the risk of retinopathy	Never/ Occasionally	10 (19.6%)	66 (41.3%)
		Routinely	41 (80.4%)	94 (58.7%)
14.	Is fundus examination required in all diabetic patients	Yes	35 (68.6%)	142 (88.8%)
		No	16 (31.4%)	18 (11.2%)
15.	In type II diabetic patients fundus examination is required	After 5 yrs	1 (2%)	30 (18.8%)
		Only when there is ocular complaint	18 (35.3%)	18 (11.2%)
		Immediately	30 (58.8%)	106 (66.2%)
		Don know	2 (3.9%)	6 (3.8%)
16.	In type I, fundus examination is required	After 5 yrs	6 (11.8%)	24 (15%)
		Only when there is ocular complaint	13 (25.5%)	21 (13.1%)
		Immediately	31 (60.7%)	109 (68.1%)
		Don't know	1 (2%)	6 (3.8%)
17,18,19	Should fundus examination and referral to ophthalmologist be done in all diabetics	Routinely	25 (49%)	98 (61.3%)
		Never	0 (0%)	7 (4.4%)
		When patients complaints	23 (45.1%)	43 (26.8%)
		Don't know	3 (5.9%)	12 (7.5%)
20.	Do you inquire about his/her eye check up on the next follow up	Routinely	31 (60.7%)	99 (61.9%)
		Occasionally	13 (25.5%)	35 (21.8%)
		Never	7 (13.8%)	15 (9.3%)
21.	Is diabetic retinopathy treatable	Yes	31 (60.7%)	107 (66.9%)
		No	20 (39.3%)	53 (33.1%)
22.	What is the treatment of diabetic retinopathy	Laser	27 (52.9%)	100 (62.5%)
		Eye drops	5 (9.8%)	17 (10.7%)
		Cant say	19 (37.3%)	43 (26.8%)

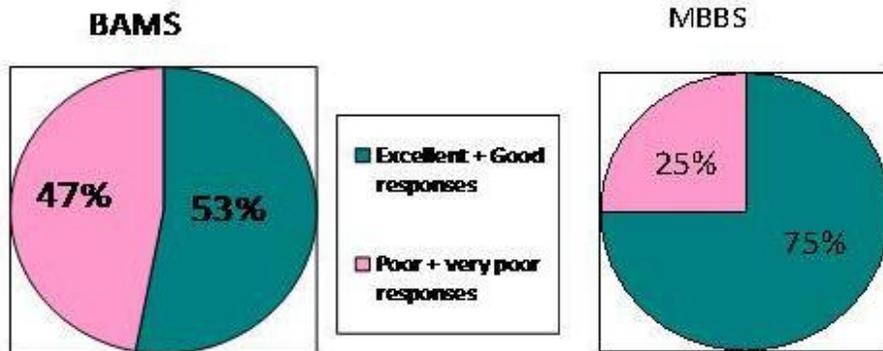


Figure 1: Analysis of responses between the two groups.

DISCUSSION

Diabetes constitutes a major public health problem in India. Diabetic retinopathy (DR) is the leading cause of

visual impairment and blindness. With the recent trend of increasing number of diabetic patients, diabetic retinopathy is an issue of great concern in both the developed and

developing world. Early detection, timely ocular treatment and good control of the underlying risk factors are of utmost importance for reducing blindness due to diabetic retinopathy. [5]

The general practitioners constitute an important part of the diabetic care network. [6] In India, in addition to allopathic medicine, up to 80% of the population use Ayurvedic and other traditional medicines, often exclusively. [7] General practitioners perform regular checks for peripheral neuropathy, nephropathy and macrovascular disease along with managing glucose control, medication and lifestyle issues. Hence, an assessment for retinopathy could easily be included as part of routine checkup. This further emphasizes that the general practitioners should have an adequate knowledge and awareness about the guidelines for screening, referral and treatment of diabetic retinopathy. This will help in early diagnosis of diabetic retinopathy and timely intervention will help in reducing the burden of blindness.

A study was conducted by Narendra P.D et al in rural district of Kolar to know the level of awareness about diabetic retinopathy among physicians. It was seen that 55% doctors were adequately aware about diabetic retinopathy while 12.20% were unaware and 25% were partially aware about diabetes related issues. [8] In another study done by Kandekar R et al in Oman, the acceptable level of knowledge among mid level eye care providers and general physicians was found in 15 (54.5%) and 4 (33.3%) respondents respectively. Of the 42 general ophthalmologists, 30 (71.4%) had an acceptable level of knowledge about primary prevention, ideal blood sugar, blood pressure levels and complications of diabetes. [9]

In our study also we found that, 53% BAMS and 75% MBBS doctors were adequately aware about epidemiology, risk

factors and management of diabetic retinopathy while 47% BAMS and 25% MBBS were not adequately aware. Only 68.6% BAMS and 82.5% MBBS doctors were aware that diabetic retinopathy is the commonest complication of diabetes. Very few BAMS and MBBS doctors knew about the various risk factors of diabetic retinopathy. Only 49% BAMS and 61.3% MBBS doctors routinely performed fundus examination for their patients. For patients with type I diabetes, only 11.8% BAMS and 15% MBBS doctors knew that the initial screening eye examination for diabetic retinopathy should be done 5 years after onset of diabetes. In patients with type II diabetes, 58.8% BAMS and 66.2% MBBS doctors knew that the initial screening examination should be done shortly after diagnosis. Screening of pregnant women who were known diabetics was considered important by only 35.3% BAMS and 46.3% MBBS doctors. Laser photocoagulation was considered as the treatment modality by 52.9% BAMS and 62.5% MBBS doctors.

Similar results were seen in a study conducted by Delorme C et al in Canada to assess whether general physicians and family medicine residents knew about guidelines for screening for diabetic retinopathy. It was seen that for type I diabetes, 13% of general practitioners and 60% of residents correctly knew the screening guidelines for diabetic retinopathy. For type II diabetes, screening protocol for diabetic retinopathy was correctly known to 80% of general practitioners and 92% of residents. Only 44% of general practitioners and 58% of residents knew that diabetic women who become pregnant should be screened for diabetic retinopathy during the first trimester and closely followed throughout pregnancy. Nearly one third of practitioners (27%) held the misconception that laser photocoagulation generally allows for

improvement of visual acuity, and 38% did not know one way or the other. About 69.3% general practitioners and 72.9% residents knew that laser photocoagulation in diabetic retinopathy helps to prevent visual loss. [10] Another study was done by Narendra P.D. et al where a total of 40 doctors (38 General physicians and 2 General practitioners) were recruited during the study period with special training in diabetes mellitus, showed similar results. Here, 25 out of 40 physicians felt referral to general ophthalmologists should be done only after patient complained of decreased vision and among them none referred their patients to retinal specialist. Only 5% of doctors did direct ophthalmoscopy as routine procedure. [7]

McCarty et al conducted a study in Australia which reported that lack of dilating drops in the practice, lack of confidence in detecting changes, concern about time taken and fear of precipitation of angle-closure glaucoma with their patients were some of the barriers expressed by general practitioners. [11] Another study conducted by Raman R et al in Chennai, showed that only 54% of the general practitioners knew about the annual dilated eye examination and referral guidelines for diabetics. Only 1.3% doctors were doing fundus examination with direct ophthalmoscope. [12]

These studies including our study revealed that general practitioners are not adequately aware about diabetic retinopathy screening protocols and its management. There is also a need for adequate training of these doctors regarding screening guidelines, referral and management of diabetic retinopathy. Adequate exposure to the use of direct ophthalmoscopy for fundus examination should be provided to the general practitioners. In addition, the barriers perceived by general practitioners need to be considered and addressed for effective management and prevention of

long term complications of diabetic retinopathy.

To combat the serious complications of diabetic retinopathy, eye screening programmes need to be held to detect the changes in early stages. These programmes should be able to attract all diabetics to avoid vision impairment due to retinopathy adding to the already existing burden of blindness in India. This will further require that the general physicians are themselves aware of the sight-threatening potential of diabetes, so that they can educate their diabetic patients about the need for regular eye examination. A general practice screening model also offers the potential to opportunistically catch unscreened diabetics presenting to the general practitioner. [13]

Knowledge of the guidelines is another important factor to consider. In USA, the American Diabetes Association has disseminated practice guidelines widely. These include improved training in diabetes management for primary care providers during residencies and continuing medical education programs; a team approach to diabetes care among primary care providers, specialists, allied health practitioners and patients. [14] In a study conducted in Australia by Awh CC et al, it was seen that education significantly improved the ability of non-ophthalmologists to detect and to appropriately refer patients who are at risk for vision loss due to diabetic retinopathy. At the end of the course, the correct response increased from a mean of 49% to 78% and the likelihood of failing to appropriately refer patients decreased from 60% to 15%. [15] Such efforts are needed in the health system of India to improve care of the world's largest diabetic population. Only by team work between ophthalmologist and primary care physician, blindness due to diabetic retinopathy can be reduced.

CONCLUSIONS

Diabetic retinopathy is the main cause of visual impairment and blindness among diabetics. Early detection and timely intervention can help to reduce the vision loss due to the retinopathy. Our study found that there is a lot of scope for improvement in knowledge and awareness related to diabetes and diabetic retinopathy among general practitioners. Continuing medical education and regular training programs to update their knowledge is recommended to improve the ocular health outcomes in diabetic patients.

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