

Original Research Article

Knowledge, attitude & practice regarding diabetic ocular complications among intern doctors at a tertiary care hospital

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Abstract: Diabetes is a global health burden and diabetic ocular complications are among common causes of blindness. Prevalence of diabetic retinopathy is 21.7% among diabetics in India. ⁽¹⁾ Early diagnosis and prompt treatment can prevent blinding complications of diabetes. Limitation to this approach is improper access to ophthalmologist. Thus it is imperative that primary health care providers should aware of the diabetic complications and referral guidelines. Intern doctors are the integral part of health care system. They are the future family physicians, resident doctors and consultants so can be the most proficient health care providers to screen diabetic ocular complications within community. Total 103 interns completed the survey conducted for diabetic ocular complications among intern doctors. After obtaining consent, basic data recorded and response checked to 20-point questionnaire. 5 marks were given for correct answer while 0 for wrong answer. Data collected was entered and managed in excel sheet and analysis conducted. Average scores was 24.76/40 for knowledge, 20.19/35 for attitude, 11.03/15 for practice with 57.82/90 total KAP score. There was moderate level of knowledge but most of interns not aware about the proper referral guideline, blinding complications and treatment options of diabetic retinopathy. Attitude regarding effect of education on diabetic ocular complications was reasonable. Referral practices also improper, most of interns declined to refer every diabetic patients for screening. Despite the moderate level of knowledge, there were existing gaps and misconceptions concerning referral guidelines, role of blood sugar and visual compromise however attitude towards disease burden and role of education is reasonable. The moderate knowledge and average attitude translate into poor practice. So it appears necessary to evaluate the training programme of intern doctors and medical students to improve the KAP regarding diabetic ocular complications for improved participation in counselling, screening and management.

Keywords: Knowledge, Attitude, Practice, KAP, Diabetes, Diabetic retinopathy.

INTRODUCTION

Diabetes Mellitus (DM) is a global health problem [1]. In terms of magnitude diabetics are growing day by day and their number will increase more than double by 2025 from its existing number of 177 million [2]. The morbidity caused by its ocular complications has placed this disease as the fourth leading cause of world blindness [3]. India. The world diabetic capital” will have 57 million diabetics by 2025 [4].

Diabetic retinopathy (DR) is among leading causes of blindness in the developed world and developing countries also fast catching up as there is decline in other causes of blindness due to improved health care facilities. Diabetic retinopathy occurs nearly in all type-I and 75% of type-II DM patients after 15 year of diabetes [5]. Diabetes is also associated with early progression & maturation of senile cataract and can lead to true diabetic cataract when blood sugar levels poorly controlled. Recurrent adnexal infections also common among diabetics.

Current treatment modalities are effective in preventing as much as 98% of vision loss due to severe retinopathy, if treatment is provided at the appropriate time [6]. Effective management of diabetic ocular complications needs a multilevel approach and participation of the community, paramedical personnel, general practitioners and ophthalmologists.

Present study sought to establish the levels of KAP of intern doctors on diabetic ocular complications at a tertiary care hospital. Intern doctors are the integral part of health care system especially at a medical college hospital. They are the future family physicians, resident doctors and consultants so can be the most proficient health care providers to screen and manage for diabetic ocular complications in community.

Prevalence of Diabetic Retinopathy

Prevalence of DR was 50.1% in Wisconsin Epidemiological Study of Diabetic Retinopathy (WESDR) among diabetic patients, 54.2% in the Diabetes Control and Complications trial (DCCT) in type-I DM patients and 35-39% in the United Kingdom Prospective Diabetes Study (UKPDS) in type-II DM patients [7-9]. In the developing countries diabetic retinopathy prevalence was reported 44.3% in Mauritius and 47.8% in Lesotho [10]. In India prevalence of diabetic retinopathy was found 21.7% among diabetics in a study conducted by All India Ophthalmological society (AIOS) in 2014 [11].

Risk Factors for Diabetic Retinopathy

Duration of diabetes is a major risk factor associated with the development of diabetic retinopathy. After 5 years of diagnosis, approximately 25% type-I diabetics have retinopathy, 60% after 10 years, and 80% after 15 years [12, 13].

DCCT study [8] demonstrated that intensive blood glucose control reduced the risk of progression of diabetic retinopathy by 54%, the development of severe NPDR or PDR by 47%, the need for laser surgery by 56%, and the risk of diabetic macular edema by 23%.

Other risk factors for progression of diabetic retinopathy include: hypertension, pregnancy, obesity, hyperlipidemia and anemia.

Treatment for Diabetic Retinopathy

In the Diabetes Retinopathy Study (DRS), pan retinal photocoagulation (PRP) was found to reduce the risk of severe vision loss in progressive diabetic retinopathy (PDR) from 15.9% in untreated eyes to 6.4% in treated eyes [14].

The Early Treatment of Diabetic Retinopathy Study (ETDRS) also demonstrated that PRP can reduce the risk of severe vision loss to < 2% if administered at the appropriate stage (severe NPDR or PDR). Secondly, focal laser treatment for macular edema was found to reduce visual loss by 50% [15,16].

The Diabetic Retinopathy Vitrectomy Study (DRVS) showed benefit of early vitrectomy in very severe PDR especially in patients with type-I diabetes. Two years after surgery, 36% of the early vitrectomy group and 12% of the late vitrectomy group had visual acuity of 6/12 or better [17].

Patients with diabetic macular edema have been found to have increased levels of VEGF in the vitreous [18]. Thus, the potent and specific anti-VEGF drugs; bevacizumab and ranibizumab are found beneficial for the treatment of diabetic macular edema.

Screening for Diabetic Retinopathy

Screening guidelines have been developed by national professional organizations such as the American Diabetes Association (ADA) [19] and American Academy of Ophthalmology (AAO) [20]. The AAO recommends that the first fundus examination in patients with type 1 diabetes should be performed 3-5 years after diagnosis. However, patients with type 2 diabetes should be examined immediately when they are diagnosed. The findings at first examination will then determine the frequency of subsequent examinations.

KAP of health care professional for diabetic ocular complications

A study in South India by Rajiv Raman *et al.* [21] assessed KAP of general practitioners (GPs), showed that 31.3% of GPs felt that diabetics should undergo eye examination every six months, 53.3% felt that diabetics should undergo eye examination every year while 15.4% felt that eye examination every two years is sufficient for diabetics. Out of the interviewed GPs 84% were aware of laser photocoagulation as a treatment modality for diabetic retinopathy. Regarding

practice for screening for diabetic retinopathy, only 1.3% GPs performed ophthalmoscopy.

Similarly, Mahesh *et al.* [22] assessed KAP pattern among GPs and other health care providers toward DR found that 55% of GPs felt eye examination was not necessary at diagnosis of diabetes, 75% thought that FFA was required in all cases of DR and 60% were not aware of surgery as an option in DR treatment.

A study in Canada by Delorme *et al.* [23] assessed awareness on Canadian guidelines for diabetic retinopathy screening among family physicians and family medicine residents found that 13% of the family physicians and 60% of residents knew that the initial screening eye examination for DR should be done 5 years after onset of type-I diabetes. For type-II diabetes, 80% of the family physicians and 92% of residents know that the initial screening examination should be done shortly after diagnosis.

MATERIAL & METHODS

Study population

Study population was intern doctors posted for their one year rotatory internship.

Type of study

A cross sectional survey.

Study period

September 2016 to November 2016.

Questionnaire

The questionnaire included specific questions regarding knowledge, attitude and practice regarding diabetic ocular complications especially diabetic retinopathy. We have prepared the KAP questionnaire according to recommendations and guidelines [24, 25]. An extensive search into the literature for previously published reports was also performed [26-29].

Questionnaire Format

Name:.....
 Age:..... Sex: M / F
 Address.....
 Phone No. :
 Date :

Consent: I am willing to provide information. My responses can be used without any change in content.

..... [Please Sign]

We are planning to gather knowledge of diabetes ocular complications among intern doctors. For helping us to decide the content, please answer the following questions.

Section:-1

- 1.1. Which eye diseases are caused by Diabetes?
- 1.2. What are the treatment options available for Diabetic Retinopathy?
- 1.3. Which diabetic patients are at greatest risk for Diabetic Retinopathy?
- 1.4. How often ophthalmic follow-up is required for Diabetic patients?

These are some common statements we hear in the community about diabetes. Please read the statement and tick your opinion between...

1. Strongly Agree	2. Moderately Agree	3. Undecided	4. Moderately Disagree	5. Strongly Disagree
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- 1.5. Diabetes can damage eyesight.
- 1.6. Retina is the main part of eyes that gets damaged in diabetes.
- 1.7. Timely treatment can delay eye damage due to diabetes.

1.8. Control of Blood sugar and lipids makes eye treatment very effective.

Section:-2

- 2.1. Uneducated people have more diabetic ocular complications than those who are educated.
- 2.2. Diabetic patients must be referred to Ophthalmologists.
- 2.3. As long as the diabetes is kept under control, there is no need to worry about diabetic complication.
- 2.4. If the doctor has told the diabetes patient to come for regular follow-up, the patient should come.
- 2.5. If the diabetes is treated early on, diabetic retinopathy can be prevented.
- 2.6. If the vision is good it means the eye is not having diabetic ocular complication.
- 2.7. Patients with diabetes often waste their time and money in eye check-ups as most of the time eyes of diabetics are normal.

Section:-3

- 3.1. We should refer diabetic patients for screening to an ophthalmologist.
- 3.2. Diabetic patients having uncontrolled blood sugar level only, should be referred to an ophthalmologist.
- 3.3. We should follow-up the patients which have referred to the ophthalmologist.
- 3.4. There is need for special training programme to improve the knowledge about diabetic ocular complications for medical students.
- 3.5. From which sources have you learned about diabetic ocular complications?

Data collection and analysis

After obtaining written consent, basic data regarding age, sex and period of internship completed were recorded. Then intern doctors were asked to respond to **20-point questionnaire**. The questionnaires were administered by investigator/co-investigator self.

In the questionnaire, first 18 questions, designed to collect information of knowledge of diabetic ocular complications (8 questions), attitude toward diabetic ocular complication (7 questions) and practices while dealing with patients suffering from diabetes and diabetic retinopathy (3 questions). Each correct answer was awarded 5 marks (total 90 marks). Each wrong answer was given 0 marks. Some questions in knowledge and practice section were open ended while a 5-point Likert type scale was used in remaining to avoid guessing. 'Moderately Agree' and 'strongly agree' options were grouped under "yes" and 'undecided', 'Moderately disagree' and 'strongly disagree' options were grouped under "no."

Data collected was coded, entered and managed in a pre-designed Microsoft excel sheet and analysis conducted using SPSS software version 17.0. Categorical and continuous variables that described the knowledge, attitudes and practices of the intern doctors on diabetic ocular complications were summarized into proportions and means/medians respectively. The findings are presented using tables and graphs.

Ethical considerations

Owing to ethical considerations permission was obtained from Institutional Ethical Committee (IEC) before conducting the study. Confidentiality of the data was maintained at all levels of data management.

RESULTS & DISCUSSION

Total one hundred three intern doctors were participated in the study. Out of them 50 were males and 53 were females with male to female ratio being 0.94:1. Mean age of intern doctors were 22.71±0.784 years with range from 21 to 25 years, thus the population was that of young doctors.

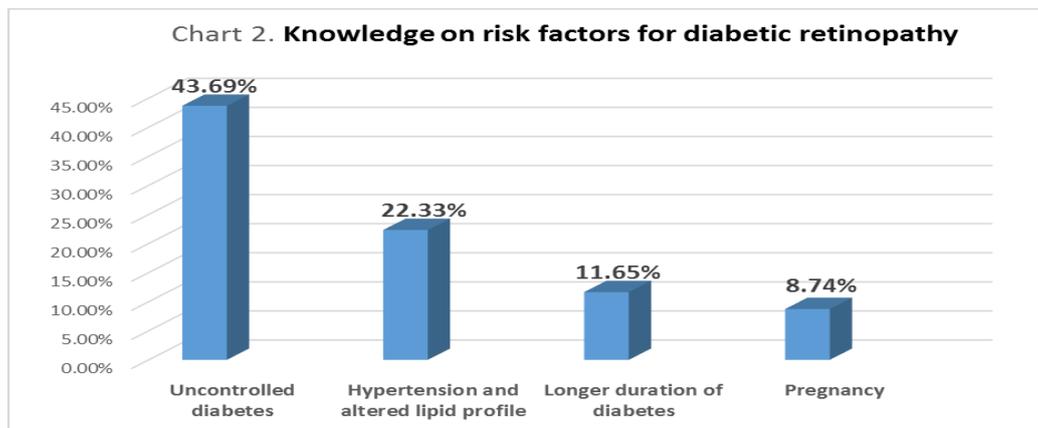
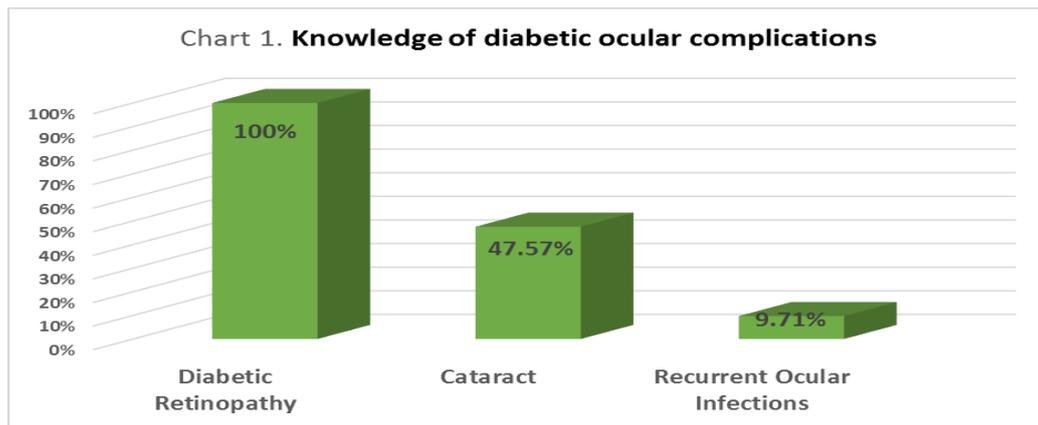
Table-1: Comparison of KAP scores among various groups

	Knowledge (±SD)	Attitude (±SD)	Practice (±SD)	KAP score (±SD)
Total	24.76 (±6.049)	20.19 (±4.234)	11.03 (±3.593)	57.82 (±10.040)
Females	25.75 (±5.860)	20.47 (±5.072)	12.02 (±3.141)	59.91 (±9.737)
Males	23.70 (±6.067)	19.90 (±3.081)	10.00 (±3.742)	55.60 (±9.881)
9 month internship completed	25.76 (±5.692)	20.49 (±4.096)	10.63 (±3.746)	58.40 (±9.748)
4 month internship completed	22.42 (±6.205)	19.52 (±4.464)	11.94 (±3.026)	56.45 (±10.564)
Ophthalmic posting done	25.34 (±6.423)	20.52 (±4.120)	11.40 (±3.717)	59.40 (±10.910)
Ophthalmic posting due	24.00 (±5.437)	19.78 (±4.340)	10.57 (±3.370)	55.78 (±8.364)

The intern doctors had a moderate level of knowledge on ocular complications of diabetes (Chart-1) including diabetic retinopathy (100%) and cataract (47.57%). This is comparable to a study by Mahesh *et al.* in India [22] and study by Muecke *et al.* in Myanmar [27] where 93.6% to 99% of doctors in

the study were aware of the blinding and other complications of DM.

The interns in our study were not very knowledgeable regarding the factors that affect presence or severity of diabetic eye disease (Chart-2).

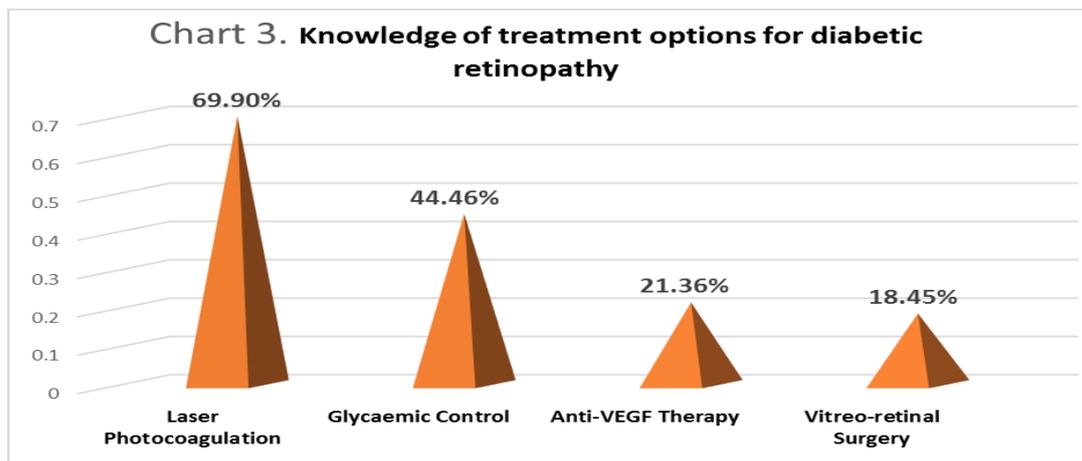


The lack of awareness among the interns in this study of the serious ophthalmic complications of diabetes such as vitreous haemorrhage, neovascularisation glaucoma and retinal detachment suggests that though the interns are aware that DM affects the eyes the specific ocular complications were unknown to them. Muecke *et al.* [27] also found a lack of awareness among the Yangon GPs on the serious ophthalmic complications of diabetes such as vitreous hemorrhage (43%) and retinal detachment (44%), and recommended medical school curriculum refreshing in their study.

The knowledge gap thus established in our study may need to be addressed through educational programs to educate interns on diabetic retinopathy and its blinding complications. Emphasis on blinding

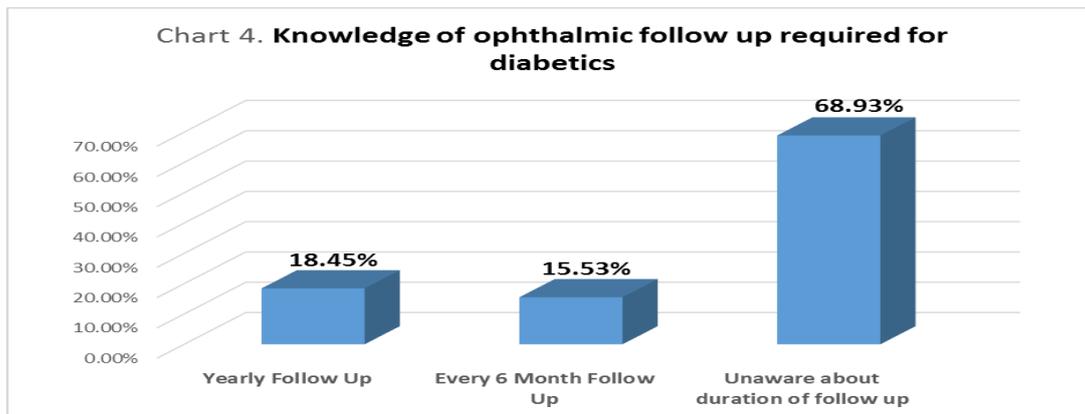
complications of DM and the need for screening and referral for DR in the medical college curriculum may also bridge this gap and prevent this cause of avoidable blindness.

A number of landmark multicentre studies have demonstrated role of early detection and prompt treatment to prevent vision loss due to diabetic retinopathy. In current study a significant proportion of intern doctors not aware of the modes of treatment options available for diabetic retinopathy (Chart-3). This is an important finding because knowledge of treatment options can influence the way of management and referral for patients by a practitioners. If they believe there is no treatment they may not see the need to screen or refer diabetic patients.



All patients should be referred to an ophthalmologist for regular fundus examination as recommended by AAO. Among the intern doctors in our study, only 18.45% aware about yearly eye examination of diabetic patients (Chart-4). This is

less than ideal and may be the reason diabetic patients are seen at eye clinics already with advanced DR. By the time the patient has visual symptoms DR may have progressed requiring complex and expensive management.



Among the interns in the study, almost all were aware that control of altered lipid profile, blood sugar and timely treatment is diabetes is

important and can delay the diabetic ocular complications (Table-2)

Table-2: Knowledge of interns on diabetic ocular complications

Statements	Right		Wrong	
	Number	Frequency (%)	Number	Frequency (%)
1.5 Diabetes can damage eyesight.	103	100%	0	0%
1.6 Retina is the main part of eyes that gets damaged in diabetes.	99	96.11%	4	3.89%
1.7 Timely treatment can delay eye damage due to diabetes.	100	97.09%	3	2.91%
1.8 Control of Blood sugar and lipids makes eye treatment very effective.	97	94.17%	6	5.83%

Majority of study population having the right attitude about role of education, early treatment and referral but many of them thought that if the vision is good it means eye is not having diabetic ocular complications and no need to worry about diabetic ocular complications until the blood

sugar level remain controlled (Table-3). 77.67% interns not agree with the statement that Patients with diabetes often waste their time and money in eye check-ups as most of the time eyes of diabetics are normal.

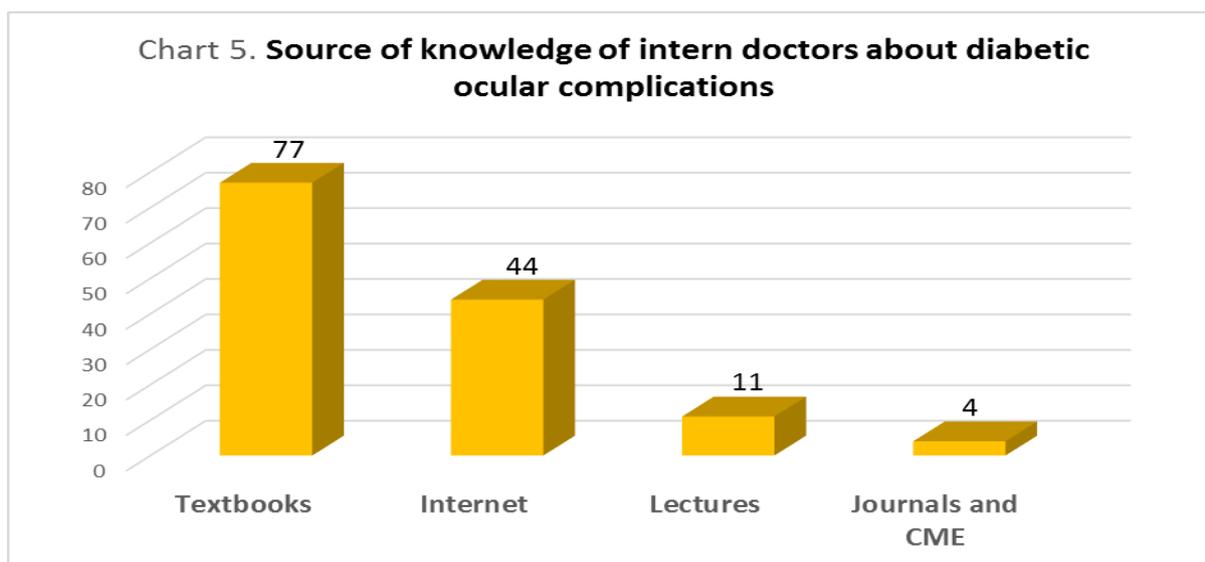
Table-3: Attitude of intern doctors regarding diabetic ocular complications.

Statements	True		False	
	Number	Frequency (%)	Number	Frequency (%)
2.1 Uneducated people have more diabetic ocular complications than those who are educated.	27	26.21%	76	73.79%
2.2 Diabetic patients must be referred to Ophthalmologists.	103	100%	0	0%
2.3 As long as the diabetes is kept under control, there is no need to worry about diabetic complication	86	83.50%	17	16.50%

2.4 If the doctor has told the diabetes patient to come for regular follow-up, the patient should come	100	97.09%	3	2.91%
2.5 If the diabetes is treated early on, diabetic retinopathy can be prevented	97	94.17%	6	5.83%
2.6 If the vision is good it means the eye is not having diabetic ocular complication.	68	66.02%	35	33.98%
2.7 Patients with diabetes often waste their time and money in eye check-ups as most of the time eyes of diabetics are normal.	23	22.33%	80	77.67%

Although most of interns not aware about the annual dialled examination guideline and at which point of time diabetic should be referred for screening but all are agreed that diabetic patients should be referred for ophthalmic check-up, 61.16% interns says that they will refer the patients with uncontrolled blood sugar levels to the ophthalmologist.

Almost all interns are agreed that there is need for special training programme to improve the knowledge about diabetic ocular complications among medical students. Seventy seven interns revealed that books are the primary source of knowledge, 44 says that they get the knowledge from internet, only 41 interns says that they gather the knowledge form the lectures and professors. Only 4 interns had the access to journal and posters for gathering information on diabetic ocular complications (Chart-5).



CONCLUSION

Present study establishes that despite the moderate level of knowledge among interns on diabetic ocular complications, there are existing gaps such as lack of knowledge on referral guidelines and treatment options for diabetic retinopathy.

The attitude of the interns in the study toward diabetic ocular complications is average and there are misconceptions concerning role of blood sugar control and visual compromise in diabetic retinopathy. Attitude towards disease burden, role of education and referral is good.

The moderate knowledge and average attitude level translate to poor practice with decline

to refer all diabetics to an ophthalmologist by many interns in their future practice.

Limitation

Only intern doctors in one hospital were included in the study. There may be differences in KAP between these intern doctors and those in other medical colleges as well as general practitioners. Thus it may be difficult to extrapolate the findings as being the true picture of all doctors in country.

Recommendations

- Training of intern doctors on diabetic ocular complications is required. This can be done through continuous medical education at health facilities and regular skills update workshops.
- Reassessing the curriculum in medical college so that medical students get more hands on training on eye examination.
- Creating awareness among diabetics regarding the blinding complications of DM so as to increase demand for early referral to an ophthalmologist and as such reduce the blinding impact of DM.

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