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Original Article

Ophthalmology Section

Assessment of Knowledge of Glaucoma in General Practitioners, Resident Doctors and Interns in Anand District, Gujarat, India

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ABSTRACT

Introduction: Glaucoma has been established as the second most leading cause of blindness after cataract, which is usually irreversible and accounts for 10.1% of total blindness worldwide. Glaucoma has affected 79.6 million people worldwide by 2020. The estimated prevalence of glaucoma in India is 12 million. The Government of India aims to reduce the prevalence of blindness to 0.25/1000 by 2025 and disease burden by one third from current levels. In a developing country, like India, 'physician of first contact' may be a general practitioner, resident doctor or intern.

Aim: To assess knowledge of glaucoma in general practitioners, resident doctors and interns in Anand district, Gujarat and to identify the level of difference of knowledge in each group and to suggest remedial measures for the same.

Materials and Methods: A descriptive semi-structured questionnaire based cross-sectional study was conducted in Pramukhswami Medical College, Karamsad, Gujarat, India, after obtaining ethical clearance from the Institutional Ethics Committee between July 2017 to September 2017. Informed written consent was taken from 240 medical doctors comprising of interns (undergoing compulsory rotatory internship), 1st to 3rd year resident doctors (postgraduate students) working in different wards of all the clinical department and general practitioners practising in radius of 15 kilometers from the main hospital located in Anand district of Gujarat state (80 in each category) and a questionnaire was administered. Participants were inquired about the knowledge of glaucoma, the sneak thief of sight. Residents of Ophthalmology were excluded to avoid bias. Cramer's V association, Chi-square test and Fisher's-Exact tests were applied for data analysis.

Results: Respondents included general practitioners, residents and interns (80:80:80). Glaucoma knowledge was to be higher in residents as compared to interns and general practitioners. About 78.75% residents scored 7 and above out of 10 whereas 61.25% interns and 50% general practitioners obtained the same score.

Conclusion: The authors found that knowledge about glaucoma in multi-scale medical practitioners was not uniform and reasonably less than it should be. Resident doctors (fresh graduates and completed compulsory rotatory internship) have better knowledge about various aspects of glaucoma as compared to general practitioners and interns which demands the need for frequent reorientation programme and internship in Ophthalmology guiding about various aspects of disease entities responsible for blindness.

Keywords: Blindness, Healthcare professionals, Irreversible optic neuropathy, Primary open angle glaucoma

INTRODUCTION

One of the aims of Government of India with reference to health services is "To reduce the prevalence of blindness to 0.25/1000 by 2025 and disease burden by one third from current levels"[1]. In the endeavour of achieving this goal, the causes of blindness and the resources of diagnostic and therapeutic nature matters a lot.

Recent estimates of visual impairment by the World Health Organisation (WHO) states that over 161 million people were visually impaired in 2002. Glaucoma has been established as the second most common cause of irreversible blindness and account for 10.1% of total blindness worldwide [2]. The estimated prevalence of glaucoma for India is 11.2 million. Primary Open Angle Glaucoma (POAG) and primary angle closure glaucoma affects 6.48 million people and 2.54 million people, respectively [3]. Worldwide, glaucoma has affected 64.3 million people by 2013, and 79.6 million by 2020, which will rise to 111.8 million by 2040 [4].

The POAG is considered as a "sneak thief of sight" owing to the nature of the disease: the slowly progressive painless diminution of vision, retention of central vision until very late in the disease and therefore a late presentation to the Ophthalmologist and about 90% remain undiagnosed [5,6]. Most of the patients have advanced visual field defects when they first present to the Ophthalmologist [7]. Almost 90% of glaucoma related blindness can be prevented with early diagnosis and proper treatment [8].

Knowledge of the disease is one of the major determinants in seeking medical help early and may also influence drug compliance [9]. The knowledge of the disease is very essential; perhaps, if the healthcare service provider is unaware or less aware about various aspects of glaucoma, it is very likely that it may get misdiagnosed or under diagnosed by the "physicians of first contact". In developing country like India, the "physician of first contact" may be a general practitioner in non institutional area of healthcare and resident or intern in an institutional setup. Thus, early and proper diagnosis of glaucoma is influenced by the knowledge of these medical practitioners of different scale. Better knowledge of the disease including diagnostic, therapeutic and prognostic modalities amongst medical practitioners is expected to play a pivotal role in early recognition of glaucoma patients and/or the patients at risk for vision loss as well as early referral to Ophthalmologist. All these might decrease the morbidity of the disease. This inturn can contribute positively in pious aim of "reducing the prevalence of blindness to 0.25/1000 by 2025 and disease burden by one third from current levels".

Study objective:

- To assess the knowledge of glaucoma in interns, resident doctors (of tertiary care teaching hospital) and general practitioners (non Institutional) in Anand district of Gujarat.
- To identify any significant difference (if present) in the level of knowledge of each group and suggest remedial measures for further improvement there upon.

MATERIALS AND METHODS

This descriptive semi-structured questionnaire based cross-sectional study was conducted in Pramukhswami Medical college, Karamsad, Gujarat, India and general practitioners in 15 kms radius from the main hospital located in Anand district of Gujarat over a period of three months (July-September 2017). The study was conducted after approval from the Institutional Ethics Committee (IEC Number-74143), abiding with the ethical principles.

Inclusion criteria: The study population was decided on the basis of convenience based sampling which included randomly selected 240 medical doctors comprising of interns (undergoing compulsory rotatory internship), 1st to 3rd year resident doctors (postgraduate students) working in different wards of all the clinical departments and general practitioners practising in radius of 15 kms of the main hospital located in Anand district of Gujarat state (80 in each category) who volunteered for the study after attaining the informed written consent for same.

Exclusion criteria: The residents of Ophthalmology Department were excluded from the study to avoid any bias.

Study Procedure

The instrument for the present study was a pretested and validated structured questionnaire, tested in 15 doctors from different department across the hospital which was consensually validated. The questionnaire was in English language comprising of 10 questions, of which eight were close ended questions and two were open ended question prepared by a Professor and Associate Professor in Ophthalmology with 22 years and seven years of experience, respectively in their profession.

The scoring for open ended question was done if the respondents mentioned their understanding of disease and treatment as per the definition of the disease and standard guidelines of glaucoma treatment [10].

The questionnaire (given below) form (blank sample in text box) that contained ten questions about knowledge of glaucoma; general knowledge (Question 1 and 6), diagnostic modalities (Question 2,3,4,5 and 7), prognosis (Question 8 and 9) and therapeutic modalities (Question 10). Since the question no.1 and 10 were of subjective type, the investigator directly asked the questions to participants and the responses were documented accordingly. Question no 2 to 9 were objective in nature and hence participants were allowed to answer in yes or no by encircling the answer.

For each correct answer one point was given and total score was given out of 10 to each participant in all the groups. All the participants were further divided in three groups.

- Group I: score of 4 or less,
- Group II: score between 5 to 7 and
- Group III: score above 7 points.

STATISTICAL ANALYSIS

Response sheets for all 240 participants were entered into Microsoft Excel and analysed using Statistical Package for the Social Science (SPSS) statistics software (IBM SPSS statistics for Windows, Version 20.0, A rmonk, NY: IBM Corp) for statistical parameters. Cramer's V association was applied {varies from 0 (corresponding to no association between the variables) to 1 (corresponding to complete association between variables)} and p-values were retrieved accordingly. The $p<0.05$ was considered statistically significant difference at 95% confidence level. In addition, Chi-square test and Fisher's-Exact test were applied wherever applicable.

RESULTS

As described in methodology, all the participant were distributed in three groups as per their score for answers given. On assessing association between the scored marks and category of study participant, it was found that there was highly statistically significant difference (Cramer's V=0.182 with p-value <0.001) among the categories of study participants (viz., intern, resident doctors or general practitioner) and the scored marks. Majority of the study participants in all three groups received score which included them in IInd/IIIrd group but residents were best in their overall performance as compared to other two counterparts. Out of total, 80 participants in residents group, 63 (78.75%) scored better and included in group III [Table/Fig-1].

Groups	Interns	Residents	General practiotioners	Total	
I	0	1 (1.25%)	2 (2.5%)	3 (1.25%)	Cramer's V 0.182
II	31 (38.75%)	16 (20%)	38 (47.5%)	85 (35.42%)	
III	49 (61.25%)	63 (78.75%)	40 (50%)	152 (63.33%)	p-value <0.001
Total	80 (100%)	80 (100%)	80 (100%)	240	

[Table/Fig-1]: Distribution of study participants according to score group revealed during assessment of knowledge about glaucoma.
p-value <0.05 considered significant

Out of 10 questions asked, question 1 and 6 were regarding general knowledge, Question 2,3,4,5 and 7 were related to diagnostic modalities, and question 8 and 9 assessed the knowledge of participants about prognosis and question 10 for therapeutic modalities available. In [Table/Fig-2] that there was no statistical significant difference between all three categories of study participants in terms of their general knowledge related to glaucoma. (question 1 and 6, p-value of 0.18 and 0.74, respectively).

In terms of knowledge regarding diagnostic modalities for glaucoma, it was found that question no. 5 (Is glaucoma always associated with high Intraocular pressure?) revealed statistical difference (p=0.05) and question no. 7 (Is glaucoma always associated with headache or watering?) showed highly statistical difference (p=0.001). Other questions related to diagnostic modalities did not reveal statistically significant differences. The question "Is glaucoma always related with watering/headache?" revealed that 71.25% of interns gave correct response while 43.75% of general practitioners and 60% of residents were correct in their answer.

In stipulations of prognosis of glaucoma, question no. 8 (Is glaucoma controllable?) revealed statistically significant difference (p=0.05) while question no. 9 did not showed the significant difference. In response to question "Is glaucoma controllable?" it was found that only 2.5% of total residents gave wrong answer while 15% of interns and 11.25% of general practitioners were wrong in their concept about this question. The knowledge regarding therapeutic modalities available for glaucoma as evaluated by question 10 also revealed statistical significant difference among all three categories of study participants. (p=0.02). It was found that 63.75% and 62.5% of Interns and general practitioners respectively had correct concepts while majority (81.25%) of the residents had correct knowledge regarding same.

DISCUSSION

The observations of present prospective cross-sectional study revealed about the knowledge of glaucoma amongst multi-scale medical practitioners of Anand district. As apparent from [Table/Fig-1], significant difference existed between three groups in the study. The knowledge about glaucoma was much higher in resident doctors, followed by interns and general practitioners. The extent of knowledge in general practitioners and intern doctors is almost similar.

Inception of Ophthalmology as a separate disciple for teaching and assessment in medical graduate course in medical colleges of India happened around the year 1997 and present guidelines by apex statutory body, Medical Council of India (MCI) in "Regulations on Graduate Medical Education" [11] took shape then. Probably not having enough exposure to the discipline as separate entity may

Question No.	Answer	Interns	General practitioners	Residents	Total	Chi-square	Cramer's V	p-value
1	Correct	71 (88.75%)	74 (92.5%)	78 (97.5%)	223	3.43	0.119617446	0.18
	Wrong	9 (11.25%)	6 (7.5%)	2 (2.5%)	17			
	Total	80	80	80	240			
2	Yes	71 (88.75%)	67 (83.75%)	76 (95%)	214	40152	0.131529464	0.13
	No	9 (11.25%)	13 (16.25%)	4 (5%)	26			
	Total	80	80	80	240			
3	Yes	74 (92.5%)	72 (90%)	77 (96.25%)	223	1.54	0.079973954	0.46
	No	6 (7.5%)	8 (10%)	3 (3.75%)	17			
	Total	80	80	80	240			
4	Yes	72 (90%)	71 (88.75%)	71 (88.75%)	214	0.01	0.006770032	0.99
	No	8 (10%)	9 (11.25%)	9 (11.25%)	26			
	Total	80	80	80	240			
5	Yes	50 (62.5%)	42 (52.5%)	58 (72.5%)	150	6.01	0. 15828508	0.05
	No	30 (37.5%)	38 (47.5%)	22 (27.5%)	90			
	Total	80	80	80	240			
6	Yes	64 (80%)	60 (75%)	61 (76.25%)	185	0.61	0.050538764	0.74
	No	16 (20%)	20 (25%)	19 (23.75%)	55			
	Total	80	80	80	240			
7	Yes	57 (71.25%)	35 (43.75%)	48 (60%)	140	12.58	0.228974162	0.002
	No	23 (25.75%)	45 (56.25%)	32 (40%)	100			
	Total	80	80	80	240			
8	Yes	68 (85%)	71 (88.75%)	78 (97.5%)	217	6.07	0.159046639	0.05
	No	12 (15%)	9 (11.25%)	2 (2.5%)	23			
	Total	80	80	80	240			
9	Yes	44 (55%)	56 (61.25%)	50 (62.5%)	150	3.84	0.126491106	0.15
	No	36 (45%)	24 (38.75%)	30 (37.5%)	90			
	Total	80	80	80	240			
10	Correct	51 (63.75%)	50 (62.5%)	65 (81.25%)	166	8.25	0.18534877	0.02
	Wrong	29 (36.25%)	30 (37.5%)	15 (18.75%)	74			
	Total	80	80	80	240			

[Table/Fig-2]: Association between category of study participants (Interns vs General Practitioners vs Residents) and their individual question vise knowledge about glaucoma.

be the cause for lack of enough knowledge in general practitioner group who graduated before year 1997. Similarity between the interns and general practitioners about knowledge can be safely attributed to the fact that though interns learned the subject in phase 3 of graduate course and were assessed, but too many of interns were yet to receive 15 days posting in the Department of Ophthalmology for acquiring skills as mentioned in the Regulations on Graduate Medical Education [11]. The skill which an intern is expected to acquire also includes "ability to diagnose and manage common conditions…" which includes glaucoma too.

The striking feature of [Table/Fig-2] is that there was no significant difference about questions of general knowledge about glaucoma (question no. 1 and 6). However, out of question no. 2,3,4,5 and 7 pertaining to diagnostic modalities; no significant difference was observed for question no. 2, 3 and 4 but question no. 5 and 7 showed significant difference in which residents ranked highest in the group for question no. 5 and same for interns for question no. 7. With reference to question no. 8 and 9 pertaining to prognosis, question no. 8 showed significant difference and residents were on top in chunks of correct answer groups. About therapeutic modality also response to question no. 10 indicates significant difference and residents being ahead than rest two.

It can be inferred that:

a) Knowledge about glaucoma in multi-scale medical practitioners is not uniform and reasonably less than it shall be.

b) Resident doctors (fresh graduates and completed compulsory rotatory internship) have better knowledge about various aspects of glaucoma as compared to general practitioners and interns (except for question no. 7 where interns showed better knowledge than even residents).

There was a similar study conducted at Yenepoya Medical College, Mangalore, India with 114 participants regarding awareness and healthcare practices among the health professionals i.e., clinicians, non clinical doctors and paramedical staff in Medical College Hospital which revealed that 65% doctors and 71% nurses had no knowledge that glaucoma affects the optic nerve, which was even lesser in Northern India i.e., 20% doctors and 35% nurses did not know the same [12,13].

A similar study was conducted regarding awareness and knowledge of glaucoma among hospital personnel tertiary care centre in rural Karnataka, with 513 participants including medical doctors, nurses, pharmacist, physiotherapist, laboratory staff and administrative staff. As per this study, 95% people were aware of this condition. Awareness regarding causes and treatment were very poor (28%) in administrative staff and high (88%) in clinicians. About 41% were aware that glaucoma can lead to blindness [14].

Limitation(s)

There are certain limitations to the present study that needs to be acknowledged. Firstly, the study was conducted on convenience-based sampling of study population, the findings though indicative, are not generalised to the entire population of 'Physician of first contact.' Secondly, questionnaire has majority of close ended questions, which might create bias, where sometimes respondents accidently end up giving correct answer, without having knowledge about the subject.

CONCLUSION(S)

In the light of their observations; the authors feel that, the 15 days posting in Ophthalmology Department for medical graduates undergoing compulsory rotatory internship must be designed in a such way that they acquire better knowledge about various aspects of disease entities responsible for blindness. There is need of frequent and periodical "Reorientation Programme" for medical practitioners specially "physicians of first contact" in our district and such programme shall encompass well-structured teaching modules on glaucoma with emphasis on diagnostic, prognostic and therapeutic aspects of the entity in question. Such continuous medical education programme may be equipped with better teaching-learning methods like group discussion, demonstration in small groups as well beyond mere didactic presentations.

"If the blind leads the blind, both will fall in a pit."

The goal "To reduce the prevalence of blindness to 0.25/1000 by 2025 and disease burden by one-third from current levels" as aimed in the National Health Policy 2017; can be achieved in a time bound phase if prevailing knowledge amongst multi-scale medical practitioners about causative disease entity is evaluated across the state and then national level. Obviously, similar studies in other parts of country have potential of assessing prevailing scenario and inturn remedial measures can be planned by policy makers. Such collective efforts will definitely yield positive results in prevention and control of blindness in India.

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QUESTIONNAIRE

1) Understanding of the condition in brief:
2) Is glaucoma associated with optic disc changes?
3) Is glaucoma associated with visual field changes?
4) Is glaucoma associated with raised IOP?
5) Is glaucoma always associated with raised IOP?
6) Is glaucoma a hereditary disease?
7) Is glaucoma always related with watering/headache?
8) Is glaucoma controllable?
9) Are the damages caused in glaucoma reversible?
10) Understanding of treatment modalities: