

Retinal examination of diabetic patients: knowledge, attitudes and practices of physicians in Oman

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فحص الشبكية لدى السكريين: معارف ومواقف وممارسات الأطباء في سلطنة عُمان

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الخلاصة: أجرى الباحثون تقييماً للمعارف والمواقف والممارسات لدى 40 طبيباً تم اختيارهم عشوائياً في المنطقة الشرقية من سلطنة عُمان عام 2003؛ وشمل التقييم معارف الأطباء غير المتخصصين بطب العيون حول أساليب فحص العيون لدى السكريين، ومواقفهم تجاه فحص قعر العين وممارساتهم تجاه الفحص العيني التفصيلي. وقد كانت معارفهم حول مختلف أجزاء العين مقبولة لدى 58% فقط من الأطباء، وكانت معارفهم عن طريقة فحص قعر العين لتحري اعتلال الشبكية السكري ضعيفة لدى 40% منهم. أما مواقفهم تجاه فحص العين من قبل طبيب غير متخصص بأمراض العيون في المستوى الأول فكانت إيجابية. وفي حيز الممارسة، حاول عشرون طبيباً منهم استخدام منظار فحص العين فلم يستطع أكثر من تسعة منهم رؤية تفاصيل الشبكية. وعلى هذا فإن الأطباء الممارسين العاميين بحاجة لتدريب تفصيلي إذا أريد لهم أن يشاركون في الكشف المبكر عن اعتلال الشبكية السكري.

ABSTRACT Knowledge, attitudes and practices of 40 randomly selected physicians was assessed in the North Sharqiya region of Oman in 2003. We evaluated non-ophthalmologist physicians' knowledge of techniques of eye examination of diabetic patients, attitudes towards fundus examination and practices of detailed eye examination. Knowledge about different parts of the eye was satisfactory in only 58% of physicians and knowledge about method of fundus examination for diabetic retinopathy was poor in 40%. Attitudes towards eye examination by non-ophthalmologists at primary level were positive. In practice 20 physicians had attempted to use an ophthalmoscope and only 9 could see details of the retina. Our general physicians would need detailed training if they are to be involved in early detection of diabetic retinopathy.

L'examen de la rétine chez les patients diabétiques : connaissances, attitudes et pratiques des médecins d'Oman

RÉSUMÉ Les connaissances, les attitudes et les pratiques de 40 médecins choisis au hasard ont été évaluées dans la région septentrionale de Sharqiya à Oman en 2003. Nous avons évalué les connaissances des médecins non ophtalmologistes relatives aux techniques d'examen ophtalmologique chez les patients diabétiques, leurs attitudes à l'égard de l'examen du fond d'œil et leurs pratiques en matière d'examen ophtalmologique complet. Les connaissances relatives aux différentes parties de l'œil n'étaient satisfaisantes que chez 58 % des médecins et celles relatives à la méthode d'examen du fond d'œil en cas de rétinopathie diabétique étaient faibles chez 40 % d'entre eux. Les attitudes à l'égard de l'examen des yeux par des médecins non ophtalmologistes au niveau des soins de santé primaires étaient positives. Dans la pratique, 20 médecins avaient essayé d'utiliser un ophtalmoscope et seuls 9 d'entre eux avaient réussi à voir les détails de la rétine. Nos médecins généralistes auront besoin de suivre une formation poussée s'ils doivent participer au dépistage précoce de la rétinopathie diabétique.

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Introduction

Visual disability due to diabetes is a major global health concern [1]. The eye health care programme in Oman aims to reduce blindness due to diabetes through early detection of eye complications among people with diabetes [2]. However, there are nearly 35 000 people diagnosed with diabetes in the 1.9 million Omani population who would need frequent eye check-ups to rule out complications, mainly diabetic retinopathy [3]. The existing ophthalmic services may not be able to cope with this increased demand. In many countries, non-ophthalmologist physicians conduct 1st level screening by performing retinal examination using an ophthalmoscope [4–7]. It was proposed that Oman should also adopt this strategy. To study the feasibility of such an endeavour, the capacity of the current cadre of physicians in retinal examination of people with diabetes needed to be assessed. The information about the existing skills of physicians could also be used to develop a training module.

We selected one region of Oman, North Sharqiya, as considerable progress has been done here in early detection of people with diabetes. North Sharqiya is a landlocked region of Oman with a population of 123 085; health services are provided free of charge through 9 primary health centres, 5 local hospitals and 1 regional hospital [8]. Two (2) ophthalmologists give eye care at 2 institutions.

Most of the physicians of the region are trained in primary eye care. Under the guidance of an epidemiologist and with the technical assistance of a senior ophthalmologist, the regional eye health care programme periodically conducts 2-day training workshops. Information on common eye diseases, especially diabetes, is provided to the participants. These trained staff subsequently treat common

eye diseases. The primary health centres are equipped to diagnose and manage common eye ailments. Direct ophthalmoscopes are available at all health institutions.

We conducted this study to determine the level of knowledge, attitudes and practices (KAP) regarding eye examination for diabetic retinopathy among non-ophthalmologist physicians of North Sharqiya region of Oman and to propose a public health policy to improve the eye care of diabetics.

Methods

We conducted this cross-sectional descriptive study between September and December 2003. The study group were physicians involved in care of patients with diabetes (family physicians, hospital physicians, diabetologists and other types of doctors) in health institutions of the North Sharqiya region. These were primary health care centres, *wilayat* hospitals and polyclinics. Primary eye care is provided by trained physicians (non-ophthalmologist) in all these institutions

To calculate the sample size for our study we assumed that 70% of the staff will have poor knowledge about retinal changes in diabetes. To achieve this, at 95% confidence level with acceptable error of 10%, at least 37 physicians were needed. To compensate for refusal we enrolled 10% more subjects. Thus the final sample size for our study was 41.

A list of Ministry of Health institutions was drawn up and, using random number tables, 6 out of 14 institutions were selected for the study. In each of these institutions, the list of all primary care physicians was obtained and physicians were randomly selected for interview. The field investigators—an ophthalmologist and public health physician in charge

of the region—visited the study sites, explained the purpose of the study to the selected participants and gave them the questionnaire. The participants were assured that the outcome would not be used for performance appraisal of individuals. To maintain confidentiality from the health centre administrators, physicians sent the completed questionnaire directly to the principal investigator. One physician refused to participate and was excluded from the study.

The questionnaire had a covering letter explaining the objectives of the study and assuring them about the confidentiality of the responses. The participants were requested to complete the forms without consulting any manuals, textbooks or fellow staff. The questionnaire included personal details, such as type of work, name, year and country of achieving medical qualification. There were 11 KAP questions about fundus examination of patients with diabetes. The questions for knowledge were open-ended and included the part of the eye to be examined for noting diabetic changes, a list of the structures of the eye and the major changes in the eye due to diabetes that could be seen with the ophthalmoscope. Attitude was assessed using close-ended questions about the logistics and capacity of fundus examination at the primary care level. Information about the current practice of fundoscopy and intensity of training needed to build capacity of a physician for retina examination was also collected using close-ended questions.

The questionnaire was prepared with the help of an epidemiologist and social scientist in English, which all participants understood. It was piloted on 4 health staff working in the department and amended for clarity of the contents. The responses during the pilot study were validated by comparing their results to a physician who

was recently trained in the United Kingdom and now during his family practice in Oman routinely examines the ocular fundus of diabetics to determine diabetic retinopathy. The response of 5 subjects who were tested in the presence of investigators was compared with that collected by post. This suggested that the social acceptance bias had a minimal effect on the study outcome.

The forms were audited after completion and then were handed over to the data manager. The data was computed using *SPSS*, version 9. A codebook was maintained for the responses. Univariate analysis was used to review the frequencies and percentages of the level of KAP of the participants. Attitudes and practices were graded as positive, negative or equivocal. For each correct knowledge answer 5 points were awarded and for a wrong answer 5 points were deducted. The sum of points for the 3 questions on knowledge was then divided into 3 equal proportions and graded into very good, good and poor knowledge. For the question about parts of the eye to examine for diabetes, if 4 or 5 parts of eye were correctly mentioned and if the retina was one of them, the grade was very good. If the retina was not mentioned and only 1 or 2 correct eye parts were mentioned, the grade was considered to be poor. Other participants with a score of 3, including the retina, were grouped as average. The score for individual question's response was summed up and grouped in 3 grades to determine participants' overall knowledge about the eye in diabetes.

Results

Profile of the study participants

Of the 40 participants, 14 (35%) were family physicians, 9 (23%) were physicians at hospitals, 1 was a diabetologist and 12 (30%) were other types of doctors

Table 1 Physicians' knowledge about parts of the eye to be examined for diabetes (n = 40 respondents)

Eye part	No.	%
Retina ^a	15	38
Cornea ^a	6	15
Optic nerve/disc ^a	9	23
Lens ^a	17	43
Blood vessels	3	8
Other	23	58

^aCorrect answers.

(information about 4 staff was missing). There were 15 participants with < 10 years of experience after obtaining their medical degree and 25 with ≥ 10 years of experience after graduation. The mean interval between physician's graduation and the present study was 12.8 years (standard deviation 6.4 years).

Knowledge about eye examination for diabetes

The response to the question regarding the part of the eye that should be examined to review the eyes of a diabetic patient is given in Table 1. The knowledge of eye parts involved in diabetes and components that could be examined by ophthalmoscope

was limited. Just over half the participants (23, 58%) correctly gave the name of one eye part that is usually affected by diabetes. Only 43% of staff knew that the lens could be affected in diabetes.

The response to the questions to evaluate the knowledge about fundus examination is given in Table 2. The knowledge of the main parts of the eye to be examined with the help of an ophthalmoscope to determine changes of diabetes was graded poor in 40% of the participants. Most physicians (88%) knew the importance of dilating pupils for retinal examination.

Attitudes

The responses to questions about attitudes to performing retinal examination is given in Table 3. A majority of respondents (74%) had a positive attitude to the role of non-ophthalmologists in retinal examination in general. However, when considering the specific situation in their institute, the regulations preventing the practice of pupil dilation in primary health centres and clients' preferences, 45% were of the opinion that this should be left to the ophthalmologists. Only 5% believed that physicians can successfully conduct fundus examination in outpatients departments.

Table 2 Physicians' knowledge of eye changes in diabetic patients (n = 40 respondents)

Item	Knowledge score					
	Very good		Average		Poor	
	No.	%	No.	%	No.	%
Which parts of the eyes should be examined to review eye changes of diabetes?	22	55	13	33	5	13
Which structures of eye can be seen by ophthalmoscope?	12	30	19	48	9	23
What are the main changes due to diabetes that can be seen on fundus examination?	10	25	14	35	16	40
Do you think dilatation of pupil is required for noting diabetic changes?	35	88	3	8	2	5

Table 3 Physicians' attitudes towards retinal examination of diabetic patients

Item	Positive		Negative		Equivocal	
	No.	%	No.	%	No.	%
Do you think fundus examination by a non-ophthalmologist would benefit diabetics in your area? (<i>n</i> = 38)	28	74	9	24	1	3
Do you think fundus examination should be done by an ophthalmologist and not by a physician? (<i>n</i> = 40)	18	45	22	55	0	0
Do you think that it is feasible for a physician to successfully conduct fundus examination in outpatients departments? (<i>n</i> = 40)	2	5	14	35	24	60

n = number of respondents.

Practices of retinal examination of diabetics

The responses concerning practices of retinal examination showed that only 20 physicians were working in institutions where ophthalmoscopes were in working order and hence had had an opportunity to perform fundus examination of diabetes mellitus cases (Table 4). However, only 9 of them said they could see some details of the retina. In the last 5 years of their working in Oman, only 10 physicians had specifically tried to use the ophthalmoscope for retinal examination of their patients.

Training of physicians for retinal examination

The responses of the participants regarding modalities of training suggested that 27% of physicians felt that a training of 1 week

duration was sufficient, while 70% of participants suggested 15 days to 1 month duration of training was essential. Only 1 participant suggested that training should be of more than 1 month duration. Most physicians (70%) believed that regional ophthalmologists could successfully train the primary staff in this screening.

Discussion

A rapid decline in communicable diseases and increasing trend of noncommunicable diseases in Oman during the last decade has prompted the health planners to change strategy [9]. However, screening more than 35 000 people with diabetes in the Omani population aged more than 20 years of age and a similar number with impaired glucose

Table 4 Physicians' use of the ophthalmoscope in their practice and their success in fundus examination of diabetic patients

Item	Positive		Negative		Equivocal	
	No.	%	No.	%	No.	%
Did you have the opportunity to use the existing equipment in your institution? (<i>n</i> = 40)	20	50	18	45	2	5
(If so, could you see the details of the retina?)	(9)		(9)		(2)	
Did you attempt fundus examination of a diabetic in Oman in the last 5 years? (<i>n</i> = 38)	2	5	14	35	24	60

n = number of respondents.

tolerance would demand large resources [3]. An organized approach for screening and management of eye complications of registered diabetes patients was laid down in all regions of Oman in 2001 [10]. In the initial period, the prevalence of diabetic retinopathy was found to be 14.4% [11] and 9% of people with diabetes had glaucoma as comorbidity [12]. The risk of visual disability in the registered diabetics was 25 times more than the general population [13]. Thus regular and periodic eye check-ups of diabetic patients is crucial to reduce blindness and to improve the quality of life of these people.

The present strength of 85 ophthalmologists in Oman is able to screen and manage eye complications of diabetic patients [10]. However, in view of the intense advocacy campaign for proactive screening of the diabetic population, referrals for eye examination of diabetics will increase [2]. Hence developing a non-ophthalmic cadre to initiate the first level of eye screening of diabetics could be helpful. General physicians could be first-level screeners but the risk of missing retinopathy changes by physicians is reported to be high [14]. This could lead to presentation of retinopathy cases in advanced stages when limited intervention can be offered to save the eyesight.

Digital documentation and use of telemedicine for detection of retinopathy changes in diabetes is adopted as an alternative strategy in many countries but the high cost is the main barrier [15–17]. The use of technological advances in combination with screening of diabetics by trained physicians using ophthalmoscopy has also been found to be a useful method [18]. Hence building the capacity of existing non-ophthalmic staff in retinal examination would be ideal. Evaluation of knowledge, attitudes and practices of the health staff would thus help in formulating the training

modules and plan the implementation of such initiatives.

Limited experience of using the ophthalmoscope during undergraduate training and professional practice in Oman was evident in our study. It should be noted that most of the primary health staff come not only from Oman but also from India, Pakistan, Sudan, Egypt and Iraq. This inevitably means that there are disparities in training in eye care. Attempts were made in the past to standardize the eye care in Oman through training workshops, but attention to diabetic eye care was not comprehensive in these workshops.

A KAP survey of eye care among primary health staff in Oman was conducted in 2000 and was found to be very satisfactory [19]. However, the primary focus in that study was on cataract, trachoma, blindness and the preventive practices, and so the outcomes of the present study differ from the previous KAP study. Our study showed poor KAP among primary health care staff. Dilatation of pupils in primary health care centres is not allowed in Oman due to the risk of precipitating glaucoma among persons with narrow angle. This could explain the poor practice of retinal examination at primary health centres. The health staff not included in the study but working in the primary health care centres were mainly resident doctors and medical officers that deal with patients in the gynaecology department. They have a limited role in the care of diabetics in the region. Thus, caution is needed in extrapolating the information of our study should to all doctors of the region.

The low KAP scores suggest that a stress on screening eye changes in diabetes and its care is needed in future training workshops for non-ophthamologists. Better advocacy [20] and coordination between physicians and ophthalmologists is also recommended in the literature to improve the care of

patients with diabetes [21]. Variations in knowledge of eye changes in diabetes suggest that all components—atomy, pathology, clinical examination and current modalities of management and prevention—should be included in the training. Different types of physicians, such as diabetologists, physicians with postgraduate qualifications and family practitioners exist in Oman. A training approach to develop the capacity of the first 2 categories could be different from that of family physicians.

The suggestions of participating physicians about duration of training should be considered when the policy for such training is formulated. However, shortages of staff both at ophthalmic units and at primary health care centres in the regions could pose logistic problems for holding such long training sessions (15 days to 1 month).

In summary, this study demonstrated limited knowledge and practice of eye care in diabetes among physicians of North Sharqiya region. To build their capacity, intense, exhaustive and well-planned training programmes are needed.

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