Acta Scientific Ophthalmology (ISSN: 2582-3191)

Volume 3 Issue 8 August 2020

Research Article

Assessing Awareness and Attitudes of the Arab Diabetic Population in Israel towards their Illness Via Ophthalmic Follow Ups and Questioners

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DOI: 10.31080/ASOP.2020.03.0147

Received: July 12, 2020

Published: July 20, 2020

Abstract

Background: Diabetes care requires close monitoring and ongoing treatment to minimize related complications. The Arab population in Israel is characterized by high prevalence of diabetes and poor disease control compared to other subpopulations in the region. This study assessed awareness to the disease and self-reported care among Arab persons with diabetes living in northern Israel via examining rates and sequences of ophthalmic examination follow ups and verified questioners.

Method: The study was carried out at the outpatient ophthalmic clinics in three Arab towns in Israel. A bilingual (Arabic and Hebrew speaking) physician administered an oral survey that accessed information regarding the awareness of patients towards their disease and their self-care. The survey comprised 12 questions relating to definitions, causes, compliance and attitudes towards diabetes. The patients' responses were compared to the data in their medical files.

Results: Participants were 44 men and 56 women. Only 43% acknowledged having diabetes. Twenty (47%) individuals who acknowledged having the disease reported taking their medications regularly, 23 (51%) reported exercising regularly, and 38 (88%) reported visiting an ophthalmologist within the previous year; compared to 0 (0%), 7 (12%) and 38 (67%) respectively of those who did not acknowledge having the disease.

Conclusion: This study showed a very low level of awareness of diabetes among patients diagnosed with the disease, as manifested by complete denial of the disease despite recommendations for treatment and large gaps in understanding. Though ophthalmic visits were relatively better in patients with acceptance and denial there are still cultural and socioeconomic barriers that hinder recognition and care of diabetes among Arab Israelis should be addressed.

Keywords: Diabetes Mellitus; Arab Population in Israel; Disease Awareness

Introduction

Diabetes Mellitus (DM) and obesity are nowadays considered an epidemic, sparing no country or population. According to data of the International Diabetes Federation, updated in 2014, 387 million people worldwide have diabetes, for an overall prevalence rate of 8.3%; the proportion undiagnosed is estimated as 46.3% [1]. The proportion of the Israeli population with the disease is quite similar, although rates differ greatly between the Arab and Jewish populations. A study of an urban population in central Israel showed prevalence rates of adult-onset diabetes as 21% and 12% among Arabs and Jews, respectively; Arab patients tended to be younger than Jews at diabetes presentation [2]. A study of Bedouin Arabs in southern Israel showed high prevalence of diabetes and poor disease control compared to other subpopulations of the region [3]. An Israeli study conducted in Maccabi Healthcare Services reported poorer diabetes control among Arabs than Jews [4]. Among overweight Arabs in an urban northern Israeli city, 27% were found to have undiagnosed diabetes [5]. Further, in the last decade, diabetes incidence rates were shown to increase in the Israeli Arab population, by 9% per 1000 person, contrasting with a decreasing rate in the Jewish population [6].

Diabetes is recognized as a disease that requires long term management, close monitoring and ongoing treatment to achieve optimal care and to minimize diabetes related complications. In 2004, the National Program for Quality Indicators in Community Healthcare in Israel initiated the dissemination of information regarding the performance of measurable health items. The indicators that related to diabetes included: glycemic control documentation, defined as the performance of at least one HbA1c test in a given year; adequate glycemic control, defined as HbA1c < 7%; and documentation of eye care, defined as at least one eye examination during a given year.

In a sample of Arab diabetic persons living in northern Israel, we assessed awareness of their disease and self-reported care and compared their responses with data from their medical records.

Methods

The study was carried out at the outpatient ophthalmic clinics in three Arab towns in Israel: Tira, Taybe and Kalanswa. A bilingual (Arabic and Hebrew speaking) physician (YPI) administered an oral survey that accessed information regarding the awareness of patients towards their disease and their self-care.

The sample comprised individuals who attended an ophthalmologist clinic in Tira, Taybe or Kalanswa. Participants were recruited consecutively; each patient previously diagnosed with type 2 diabetes, who entered the examination room was offered to participate in the study. Informed consent was obtained from those interested in participating. Clinical data, including history of the disease, dietitian's recommendations, glucose blood levels and HbA1c levels were retrieved from medical records. These data were compared to patient responses regarding self-care.

The survey comprised 12 questions relating to definitions, causes, compliance and attitudes towards DM. The full questionnaire appears as table 1. The questionnaire was based on a number of validated epidemiological studies [7,8]. The patients' responses were compared to the data in their medical files. The following responses were considered discrepant: denial of the illness, a delta of > 3 years in assessment of disease duration, assessment that the disease is under control when two recordings in the medical file during the previous 18 months showed fasting blood glucose levels over 150 mg% or HbA1c > 7%, unawareness of normal blood glucose level or a deviation of over 50mg% from normal (100 mg%), ignorance of the most recent HbA1c level, or a deviation of over 0.5%. Other answers were documented as stated.

Controlled diabetes was defined as HbA1c < 7%. A deviation of 50 mg% between patient responses and the data in the medical records was considered a difference between the two information sources.

No.	Question
	Do you suffer from diabetes? (According to the medical records, all had diabetes.)
	How long have you had disease? (The response was compared to data in the medical records.)
	Is your diabetes under control? (This information was compared to data from the medical records.)
	What are normal glucose levels?
	What was your last HbA1c level? (This information was retrieved from the medical records.)
	When did you last check your glucose level?
	How often do you check your glucose levels at home?
	Why do you think you have diabetes? Or: what causes diabetes? (for a patient who does not acknowledge having the disease)
	When was your last visit to the ophthalmologist? (This information was retrieved from the medical records.)
	Do you follow your treatment plan and your pharmacological regimen?
	Do you exercise on a regular basis?
	Have you ever consulted a dietitian? (Answers were compared to data found in medical records.)

Table 1: Full questionnaire for DM patients.

Statistical analysis was done using Chi square and Student's t-test. The analysis was made by SPSS (VERSION 20 SPSS Inc.) software. Statistical significance was defined as $p < 0.05$.

Results

The sample comprised 44 men and 56 women.

Below are the participants' responses to the 12 questions in the interview:

1) Do you have diabetes?

   Only 43% of the participants stated that they have diabetes, 31% said they do not have diabetes, and 26% said they did not know (Figure 1).

2) How long have you had diabetes?

3) Is your diabetes under control?

   Only the 43 participants who acknowledged having diabetes answered this question. Of them, 20 (47%) claimed to have balanced blood glucose and thus controlled diabetes; however,

according to the medical data, only for 7/20 (35%) was their HbA1c < 7% or fasting BG < 150 mg/dl. Of the 14/43 (33%) who said that their diabetes is not under control, 3 (21%), had controlled diabetes according to the medical records. For the 9/43 (21%) who did not know if their diabetes was under control, the medical records did not show good control for any (Figure 2).

According to the medical records, diabetes was controlled for 58% of those who denied having diabetes, and for 65% of those who did not know if they had diabetes.

4) What are normal blood glucose levels?

Seventeen (17%) of the participants correctly stated normal glucose levels (less than 100 mg%), 54% answered incorrectly, and 29% did not answer.

5) What was your last HbA1c level?

Twenty-three (57%) of those who acknowledged having diabetes knew their last HbA1c level, compared to 5 (17%) of those who stated not having diabetes (Table 2).

6) When did you last check your glucose level?

7) How often do you check your glucose levels at home?

Of the patients who acknowledge their disease, 26/43 (61%) reported checking their glucose levels daily, 15 (35%) checking once every other week and 2 (5%) every 6 - 12 months.

Of the patients who denied their disease, 5 (16%) reported checking their glucose levels daily, 20 (65%) checking once every other week and 6 (20%) every 6 - 12 months.

Of the patients who were uncertain as to whether they have the disease, 9 (35%) reported checking their glucose levels daily, 11 (42%) checking once every other week and 6 (23%) every 6 - 12 months (Table 2 and figure 3)

8) Why do you think you have diabetes? Or, what causes diabetes?

Of the 100 participants, 48 (48%) responded that the cause of diabetes is hereditary, 15% thought the cause was faulty nutrition, 16% thought stress was the cause and the remaining 21% patients did not have an explanation for the etiology of disease (Table 2 and figure 4).

9) When was your last visit to the ophthalmologist?

These data were retrieved from the medical records (Table 3).

Of the 43 patients who acknowledged their disease, 12 (28%) visited their ophthalmologist in the previous 3 months, compared with 5 (16%) of those who denied having diabetes and 3 (12%) who did not know whether they had diabetes.

Of patients who acknowledged their disease, 29 (67%) visited their ophthalmologist in the previous 6 months, compared with 7 (31%) of those who denied having diabetes and 16 (62%) of those who did not know whether they had diabetes.

Of patients who acknowledged their disease, 38 (88%) visited their ophthalmologist in the previous year, compared with 17 (55%) of those who denied having diabetes and 21 (81%) of those who did not know they had diabetes.

10) Do you follow your treatment plan and your pharmacological regimen?

Patients who did not acknowledge their disease did not take prescribed drugs nor follow any treatment plan. Of the 43 who acknowledged their disease, 20 (47%) reported taking their medications regularly, 16 (37) did not take their medications and 7 (16%) took their medications but not on a regular basis.

11) Do you exercise on a regular basis? Of the 43 who acknowledged the disease, 22 (51%) reported exercising on a regular basis, compared with 7 (23%) of those who denied having the disease. None of those who did not know if they had diabetes reported performing physical exercise on a regular basis (Figure 5).

12) Have you ever consulted a dietitian?

The answers to this question were compared to the data found in medical records. None of those who denied having diabetes, nor any of those who were uncertain whether or not they had diabetes, ever consulted a dietitian, according to their self-report and according to the medical records.

Fifty-two (52%) stated that they were never offered consultation with a dietitian. According to the medical records, 63% were offered dietitian consultation at least once.

Discussion and Conclusion

This study showed an overall low level of awareness to diabetes, as well as a great difference between patients' perception of their disease and their actual state, as appeared in their medical records. Patients' ignorance of their condition begins with the mere knowl-

Figure 1: Responses to question 1- Do you suffer from dm?

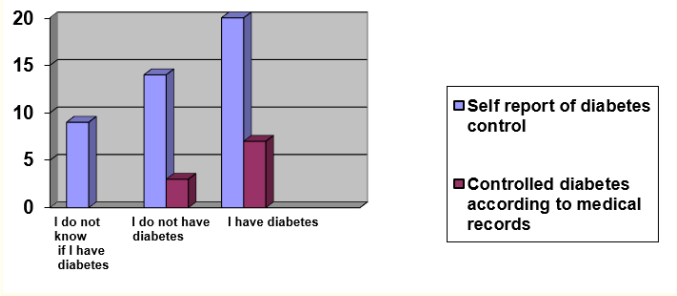

Figure 2: Responses to question 3 - Is your diabetes under control?

Item	Stratification by acknowledgement of diabetes			Totals
	Yes (n = 43)	No (n = 31)	Do not know (n = 26)	
Diabetes is controlled (self-report)	20 (47%)	28 (90%)	21 (81%)	69%
Diabetes is controlled (medical records)	10 (23%)	15 (48%)	9 (34.6%)	34%
Knew normal blood glucose levels	10 (23%)	5 (16%)	2 (7.7%)	17%
Knew last HbA1c level (self-report)	23 (57%)	5 (17%)	6 (24%)	34%
Last HbA1c level (medical records)	21 (47%)	2 (6%)	2 (7.7%)	25%
Daily glucose self-monitoring	26 (61%)	5 (16%)	9 (35%)	40%
Patient explanation for disease				
Hereditary	11 (72%)	17(87%)	20 (85%)	48%
Poor nutrition	8 (18%)	4(13%)	3 (34%)	15%
Visited ophthalmologist during the previous year (medical records)	38 (88%)	17 (55%)	21 (81%)	76%
Takes diabetes medications regularly	20 (47%)	0	0	20%
Exercises regularly	22 (51%)	7 (22%)	0	29%
Consulted a dietitian, at least once (self-report / records)	26 (60%)	0	0	26%
Was never offered consultation with a dietitian (self-report)	37 (86%)	30 (97%)	26 (100%)	93%
Was offered consultation with a dietitian, at least once (records)	23 (54%)	21 (68%)	13 (50%)	67%

Table 2

Figure 3: Responses to question 7 - How often do you check your glucose levels at home? DM: Diabetes Mellitus.

Figure 4: Responses to question 8 - Why do you think you have diabetes?

Last visit to the ophthalmologist	Have diabetes (n = 43)		Does not have diabetes (n = 31)		Does not know of having diabetes (n = 26)	
	%	n	%	n	%	n
Within 3 months	28	12	16	5	12	3
More than 3 months, within 6 months	40	17	7	2	50	13
More than 6 months within 12 months	21	9	33	10	19	5
More than one year	12	5	45	14	19	5

Table 3: Answers to Question 9- When was your last visit to the ophthalmologist?

Figure 5: Responses to question 11 - Do you exercise on a regular basis? DM: Diabetes Mellitus.

edge of whether they have the disease; the majority either stated that they do not have diabetes or that they do not know if they have diabetes. Compared to those who did not acknowledge having diabetes, a higher proportion of those who acknowledged having the disease reported taking their diabetes medication, daily monitoring of blood glucose, more recently visiting an ophthalmologist, regular exercise, and having consulted with a dietitian. Medical records showed a greater proportion of individuals with controlled diabetes among those who did not acknowledge having the disease or who did not know if they had it, than among those who acknowledged having diabetes. As such, less severe disease and shorter duration may account in part for the lack of its acknowledgement.

The overall lack of knowledge of normal glucose values was alarming, with only 17% responding correctly. Thus, most of the patients who check their blood glucose at home were unaware of target levels or of results that require emergency action or notification of a physician. Wang., *et al*. [9] found that only 49% of adult diabetic patients attending a tertiary ophthalmic center had heard of the HbA1c test and only 17% understood its meaning.

More than one half of the participants in the current study stated that they were not offered consultation with a dietitian. This contrasts with the medical records that showed that 67% were offered such consultation. Another study conducted in an Arab town in Israel reported that more than one-third of respondents reported not receiving any counseling on issues such as foot care or the effects of smoking on diabetes [10]. Among diabetes patients hospitalized in Jerusalem, a smaller proportion of Arabs than of Jews reported receiving counseling for improving nutrition and physical activity, and guidance in performing self foot examinations [11].

We did not assess the reasons why 80% of participants in the current study reported not taking their diabetes medications regularly. In another Israeli study, more than one-third of Arabs with diabetes stated not taking diabetes medications due to financial constraints [10]. Among Arab Bedouins in the Negev, 47% of those with low adherence to medications for diabetes, hypertension and dyslipidemia were of the belief that traditional therapy can replace prescribed medications, compared to 26% of those with high adherence; 65% and 47%, respectively believed that the side effects of prescribed drugs are worse than the disease itself [12]. The majority of participants of the current study thought the reason for their disease was hereditary, thus inevitable.

The conduct of the study in an ophthalmologist clinic raises the possibility of selection bias. Accordingly, rates of performance of eye examination, as well as other self-care indices and knowledge, may be even lower among Arabs who did not attend a clinic. The access of information by means of interviews conducted by the patients' physician raises the possibility of interviewer bias. The patients may have tried in their responses to please the interviewer. Thus, the actual compliance to care may be even worse than the data presented.

This study did not analyze the population according to level of education and socioeconomic status, though several other studies showed correlations of low levels of education and socioeconomic status, with lack of knowledge and poorer control of diabetes [4,9,13,14]. Nevertheless, the greater risk for diabetes among Arabs has been reported to be independent of lifestyle factors, family history of diabetes and, among women, history of gestational diabetes [2]. According to the socioeconomic clusters defined by the Israeli Central Bureau of Statistics, the towns of Tira, Taybe and Kalanswa, are ranked in clusters 4, 3 and 2 respectively (on a scale of 1, lowest, to 10, highest) [11]. The clinics involved in this study are affiliated with Clalit Health Services, which reported that the quality indicators program has reduced inequalities in healthcare between the Arab and Jewish populations in Israel, as well as between persons of different socioeconomic levels [15]. The current study shows that large gaps in knowledge and healthcare persist in the Arab population. The repercussions on disease progress and prognosis, and on life expectancy and quality are evident. Following years of leveling off, from 2000, the gap in life expectancy between Israeli Arabs and Jews increased; such trend is mainly due to differences between the populations in the prevalence of chronic diseases, such as heart disease and diabetes [16].

We recommend the conduct of further studies, such as the investigation among other Arab and also Jewish subpopulations in Israel, of awareness and attitudes towards diabetes disease.

In summary, the results of our study show a very low level of awareness of diabetes among persons diagnosed with the disease, as manifested by: complete denial of the disease despite recommendations for treatment, lack of understanding of the importance of home monitoring, lack of knowledge about normal values and the etiology of the disease and lack of maintenance of a healthy lifestyle that includes physical exercise on a regular basis. The cultural and socioeconomic barriers that obstruct acknowledgement and care of diabetes among Arab Israelis should be addressed.

Competing Interests

All authors declare no competing interests with this work.

Funding

No external funding was used to conduct this study.

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