Treatment Related Misconceptions among Diabetic Patients; a Call for Action.

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Background: Diabetes mellitus is one of the most widely distributed metabolic disorders which occur in almost all populations of the world at a variable prevalence. Patients' behaviours and level of education constitute obstacles to compliance with treatment. One of these behavioural attitudes is treatment–related misconceptions, such misconceptions may reflect negatively on patients.

Patients and Methods: A cross sectional study on treatment-related misconceptions among diabetic patients was carried out during the period between 1st March and 31st August 2004. A total of 985 diabetic patients were included in the study sample. Data collection was achieved through interviews using structured questionnaire.

Results: The results showed that the most frequent misconceptions with an impact on treatment was considering vitamins necessary for diabetics in 656 (66.6%) and believing that oral anti-diabetic drugs to be more effective than injectable insulin in 609 (61.8%). Gender, family history, and duration of disease did not show a statistical significant association with the score of misconceptions. The logistic regression findings with risk of having a high score of misconception as the dependent factor and several independent variables revealing the significance of age, educational level, and type of Diabetes mellitus.

Conclusions &recommendations: Treatment-related misconceptions present in the study group at high rates. Being old age, illiterate, and having type II diabetes mellitus are more prone to these misconceptions. A wide scale national study is recommended and a community based health education need to be enhanced by; all mass media channels, and by establishing health education units in all diabetic centers.

Keywords: Treatment-related misconceptions, diabetic.

Introduction:

Diabetes mellitus (DM) is one of the most widely distributed metabolic disorders which occurs in almost all populations of the world at a variable prevalence[1] .

Epidemiological investigations show that diabetes mellitus is a serious and increasing problem in developing countries [2], and it continues to affect every region of the world but newly industrialized and developing nations may be especially impacted [3]. There are over 110 million people with non-insulin DM world wide, this number is estimated to rise to 240 million by the year 2010[4].

The goal of therapy is to maintain glucose levels within an acceptable range. This will prevent acute complications and reduce or prevent long term complications. In type I DM glycemic control is accomplished with an integrated program of diet, self-monitoring of blood glucose (SMBG), exercise, and insulin replacement. Proper diet, balanced by insulin replacement is the cornerstone of treatment [5]. In type II DM the major components of the treatment of diabetes are: nutritional therapy; oral hypoglycaemic therapy; and insulin treatment [6]. Approximately 50% of new cases of diabetes can be controlled adequately by diet alone, (20-30%) will need oral hypoglycemic drugs, and (20-30%) will require insulin [7].

Among many other reasons, patients' behaviours arising from culture, traditions and level of education constitute obstacles to compliance with treatment. One of these behavioural attitudes is treatment–related misconceptions, such misconceptions may reflect negatively on patients. In order to deliver effective health education for patients, it is important for physicians to recognize these misconceptions and attempt to correct them [8].

This study sought to determine the different kinds of treatment-related misconceptions among a sample of diabetic patients and to find out the relation of these misconceptions with some variables.

Patients & Methods:

A cross-sectional study was carried out in the National Diabetes Center (NDC) in Al-Mustansirya University during the period between 1st March and 31st August 2004. The NDC is a specialized center for treatment and research work on diabetes. It includes an out patient clinic for treatment and follow-up of diabetic patients (pediatrics and adults) and a

nutritional clinic for nutritional rehabilitation, but there is no health education unit.

The study sample consists of 985 diabetic patients selected on a convenient base. Any patient more than 17 years of age with an established diagnosis of DM (type I or II) registered in the NDC was included in the study, while diabetics of 17 years and below and gestational diabetes were excluded.

Data collection was achieved through interviews conducted by the researcher using structured questionnaire. The researcher used to visit the center (3) days/week for 3-4 hours/day and any subject matching the above mentioned criteria was interviewed. The questionnaire consisted of two parts: The first part includes data on some socio-demographic characteristics; the second part includes a list of (15) misconceptions related to the treatment of diabetes

Attempts had been made to assure privacy during personal interview. An informed verbal consent was obtained from the study subjects before enrolment in the study.

Data were translated into a computerized database structure. Statistical analyses were done using SPSS version 11.5 computer software (statistical package for social sciences-version 11.5).

A score for misconception was assigned by giving zero score for "No" answers and one score for "Yes" answers given by the diabetic patients.

Then mean and standard deviation of score were calculated and patients were categorized into two categories according to the median score.

To measure the strength of association between an outcome dichotomous variable and a dichotomous independent variable, the odds ratio (OR) was used. The 95% confidence interval of OR was used to assess the statistical significance of the calculated OR at 0.05 level of significance, The statistical significance of association between two categorical variables was assessed by Chi-square test, Fisher-Exact test sometimes needed for correction. An association was considered statistically significant if its P-value was 0.05 or less. A multiple logistic regression model with several selected independent variables and having a high score of misconception as the dependent (outcome) variable was used to assess the risk of having a high score in the presence of a certain independent (explanatory) risk criteria while adjusting for other independent variables included in the model.

Results:

The total number of study sample was 985. Females were 491 most of them (50.3%) were of 40-59 years age group and males were 494 again most of them were of 40-59 years age group (Table-1). The mean number of misconception was (6±3.3) among the sample with a minimum (1) and maximum (11) misconceptions.

General description of misconception: Table (2) shows the frequency of misconceptions from the highest to the lowest percentage. The most frequent of these misconceptions was "vitamins are necessary for diabetics" (66.6%) and believing that "oral anti-diabetic drugs are more effective than injectable insulin" in the treatment of DM (61.8%). About one half of the study sample believes that "anti-diabetic drugs cause habituation and addiction".

Score of misconception:

Considering the younger age group (<40 years) as a reference group, the risk of having high score of misconceptions (poor outcome) was significantly higher (3 times) in 40-59 years age group and (2.75) times in old age group (≥60 years) 95% C.I. was 2.1-4.4 and 1.9-4.1 respectively.

The results regarding educational level showed that the illiterates had high score of misconceptions which was significantly higher (2 times) as compared to higher education (95% C.I.=1.4-2.8).

Type II DM had higher score of misconceptions which was significantly higher (3 times) than patients with Type 1DM (95% C.I. =2.2-4.1).

Table 1: The distribution of the study sample by age and sex.

Age (years)	Male		Female		Total	
	No	%	No	%	No	%
<40	85	17.3	89	18.1	174	17.7
40-59	226	45.7	247	50.3	473	48.0
≥60	183	37.0	155	31.6	338	34.3
Total	494	100%	491	100%	985	100%

Table 2: The reported misconceptions according to their magnitude.

Misconceptions	No	%
Vitamins are necessary for diabetes	656	66.6
Oral anti-diabetic drugs are more effective than injectable insulin	609	61.8
Anti-diabetic drugs are addictive	490	49.7
Oral anti-diabetic drugs and injectable insulin have many side effects	465	47.2
Bitter food reduces the level of glucose in blood	394	40.0
Oral anti-diabetic drugs have the same effect of injectable insulin	393	39.9
A diabetic can eat whatever he/she likes as long as he/she continue his/her treatment	393	39.9
Sakarin (artificial sweeteners) can cause cancers	310	31.5
Antidiabetic drugs efficiency depends on its price (the more expensive the more efficient)	252	25.6
Herbal medicine use instead of/or in addition to anti-diabetic drugs is beneficial to diabetics	201	20.4
Treatment must be stopped on being asymptomatic	178	18.1
Treatment must be stopped the day prior to performing a FBS	75	7.6
Water intake should be decreased when passing large amounts of urine	56	5.7
Treatment must be stopped in case of having another illness	31	3.1
Treatment should not be stopped prior to performing a FBS	18	1.8

Regarding sex, family history, and duration of disease did not show significant difference from reference points (Table 3).

Risk: Table (4) shows the logistic regression findings with risk of having a high score of misconception as the dependent factor and several independent variables in its two steps revealing the significance of age, educational level, number of visits and type of DM.

Table 3: The distribution of misconceptions among the study groups.

	Total No.	High score of misconception (≥Median)		OR	95% C.I of OR
		No	%		
Sex					
Male	494	234	47.4	-	
Female	491	260	53.0	1.25	1.0-1.6
Age (years)					
<40	174	51	29.3	-	
40-59	473	263	55.6	3.0	2.1-4.4*
≥60	338	180	53.3	2.75	1.9-4.1*
Educational level					
Illiterate	229	140	61.1	2	1.4-2.8*
Primary	190	93	48.9	1.2	0.8-1.8
Secondary	276	133	48.2	1.2	0.9-1.6
Higher education	290	128	44.1	-	
Average No. of visits per year					
<6 visits	543	293	54.0	1.4	1.1-1.8*
≥6 visits	442	201	45.5	-	
Family history of DM					
Negative	347	178	51.3	1.1	0.8-1.4
Positive	638	316	49.3	-	
Duration (years)					
<5	417	201	51.6	-	
≥5	568	293	48.2	1.1	0.9-1.5
Type of DM					
Type-I	223	67	30.0	-	
Type-II	762	427	56.0	3.0	2-4.1*

* Significant

Table 4: The logistic regression model with risk of having a high score of misconception as the dependant factor and several selected independent variables.

Step one: All variables included	**P**	**OR**
Sex (female compared to male)	0.38	1.1
Age (40-59 compared to <40)	0.37	1.3
(≥60 compared to <40)	0.037*	1.7
Educational level (Illiterate compared to higher education)	0.03*	1.6
(Primary compared to higher education)	0.45	1.2
(Secondary compared to higher education)	0.19	1.03
Average No. of visits per year (<6 compared to ≥6)	0.06	1.4
Duration (years) (≥ 5 compared to <5)	0.2	1.2
Family history of DM (Negative compared to positive)	0.23	1.2
Type of DM (Type II compared to type I)	0.001*	2.4
Step Two: Significant variables included only		
Age (40-59 compared to <40)	0.37	1.4
(≥60 compared to <40)	0.03*	1.7
Educational level (Illiterate compared to higher education)	0.007*	1.7
(Primary compared to higher education)	0.39	1.2
(Secondary compared to higher education)	0.17	1.3
Average No. of visits per year (<6 compared to ≥6)	0.02*	1.4
Type of DM (Type II compared to Type I)	0.001*	2.2

*** Significant**

Discussion:

Diabetes mellitus is a chronic disease; its management requires the cooperation between the patient and health staff. The rate and nature of treatment-related misconceptions seen in this study were both relatively very frequent, and at the same time related to common day to day management of diabetes.

Misconceptions:

In the present study, the most frequent misconception reported by diabetic patients with an impact on treatment was considering "vitamins necessary for diabetics" (66.6%) and next was believing that "oral anti-diabetic drugs are more effective than injectable insulin" (61.6%). However, the study conducted by Shaaban[9] had shown that the most frequently reported misconceptions with an impact on treatment was considering vitamins as an essential part of treatment (42.8%), the next misconception was believing that bitter food can buffer hyperglycemia and aid in the control of DM (42%).

Sex:

There was no statistically significant association between males and females at the rate of misconceptions. This result agrees with Ford and his colleague [10] study that had shown that the knowledge regarding diabetes was not influenced by the patients` sex. However, the results disagree with the results of Al-Faris study [11] that had shown that the misconceptions were significantly more in females than in males.

Age:

The old age group had a high rate of misconceptions than the young age group. This result is agreeable with the result of Ford and his colleague

[10] who had shown that the score was significantly higher among older age groups.

Educational level:

In the present study a statistically significant association was found in the knowledge scores of misconceptions among the four educational levels. Patients with higher educational level are more likely to seek information about their illness from books and literatures than patients with elementary education only and they are more likely to ask their physicians about their diseases and their managements in details. This result is applicable with the previous reports which showed that patients with higher educational levels have better knowledge concerning diabetes [12].

Family history:

There was no statistical significant association between family history of DM and the rate of high score of misconceptions. This result is contradictory to previous results that had shown that the patients with positive family history of diabetes were associated with higher rate of misconception. This may support the finding that the characteristics of the family determine the self care practice [8] [13].

Duration of disease:

Again the study results did not show any relationship between the duration of disease and the rate of misconceptions. However Shobhana and his colleague showed that the rate of misconception was significantly higher among patients suffering from the disease for less than five years [14]. While Ford and his colleague showed that the rate of misconceptions was significantly higher among patients suffering from the disease for more than five years [10].

Type II DM:

The rate of high score of misconception was significantly higher among patients with type II DM compared to patients with type I DM ($P<0.001$). On the contrary, Bahru & Abdul Kadir (15) and Shaaban [9] reported that patients with type I DM had significantly higher score ($P<0.001$) for over all misconceptions when compared to type II DM patients.

Overall risk:

The overall risk profile after using multiple logistic regression model had shown that only four variables were statistically associated with the rate of misconception, these variables include old age groups, illiteracy, less than 6 annual visits, and type II DM. This finding points to the target population of diabetic patients to whom treatment-related health education should be directed in order to help them effectively control this serious disease. In another study like that conducted by Al-Saeedi and his colleague [8], it was shown that the overall risk profile of the variables which were statistically associated with high misconceptions rate included female sex, older age, less than five years duration of diabetes, and patients having their follow-up in different centers.

Conclusions and recommendations:

Treatment-related misconceptions appear to be present in the study group at high rates. Being old age, illiterate, and having type II DM are more prone to these misconception. That is why a wide scale national study is recommended for further understanding of treatment-related misconceptions of DM. A community based health education need to be enhanced by; all mass media channels, and by establishing health education units in all diabetic centers.

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