DIABETIC PATIENTS' ADHERENCE TO MEDICATIONS AND RELATED FACTORS IN A SAMPLE OF THE IRAQI POPULATION

[1]WROOD SALIM AL-KHFAJY, [2]AMANI ANEES ABODDY, [3]INAM SAMEH ARIF

[1,2,3]Department of pharmacology and toxicology, college of pharmacy, Mustansiriyah University, Baghdad, Iraq.
E-mail: amanyanees87@gmail.com

Abstract- The purpose of this study was to estimate the rate of adherence to anti-diabetic drugs among diabetic patients in Baghdad, Iraq. Morisky Medication Adherence Scale was used to evaluate the adherence rate in 100 diabetic patients attended the Baghdad hospital/ Medical City in 2017.The chi-square test was used to evaluate the significant association among the groups. The adherence rate in this study was considered relatively low (45%) while 55% were considered non-adherent in which interfere with their meal program are the most reasons for non-adherence.

Keywords - Adherence rate, Diabetes mellitus, Morisky Medication Adherence Scale-4.

I. INTRODUCTION

Diabetes mellitus (DM) is the major community health problem and the incidence of diabetes is increasing around the world. Recently, 387 million persons have Diabetes mellitus [1] and are predictable to be 483 million in 2030[2] and the number may be increase to 592 million in 2035 [1], 90% of DM cases are with type 2 [3]. DM is the main reason for more than 77% of morbidities and 88% of deaths in developing countries.The increasing rate in type 2 diabetes is associated with hypertension, obesity, and in elderly people[1].

Type 2 DM usually occurs in 40 years old people and over, but recently it is increasing in children and young adults due to decreased in physical activity, rapidly lifestyle, fast foods, leading to obesity [4].

Treatment programs can be affected by many factors other than glycated hemoglobin (HbA1c) level such as arterial hypertension (C140/80 mmHg) and dyslipidemia [low density lipoprotein (LDL) 2.6 mmol/L; triglycerides1.7 mmol/L] and the importance of monitoring these risk factors is needed to control the DM treatment regimens [5].

Adherence, as used in long term diseases, was defined by the WHO as the extent to which a person's behavior with consideration to take therapies, following a diet, and/or performing lifestyle changes, corresponds with agreed recommendations from a healthcare provider [6].

The rates of Adherence are generally decreased with chronic diseases; this is correlated with the nature of chronic illness that characterized by long term treatments and therefore the adherence rates is reduced rapidly after the first 6 months of treatment [7]. Such decreased adherence rates lead to poor health consequences and also effect on costs of healthcare [6].

Adherence can be measured by different Methods either direct (biological marker), which is mostly sensitive but it is not typically practical and also invasive method, or indirect (self-reporting, questionnaires) [8].

Guidelines from the European Association for the Study of Diabetes (EASD) draw attention about the importance of exercise and diet in the treatment of type 2 diabetes mellitus [9]. In spite of the roles of exercise, adherence to exercise courses can vary between 10% and 80% in a long-term [10].Decrease of motivation and injuries are the most reasons for non-adherence to exercise [11].

There are abundant reviews proved that there is an opposite correlation between taking one or more oral hypoglycemic agents (OHA)s and HbA1c level, in which each 10% increase in oral hypoglycemic agents adherence associated with a decrease of 0.1% in HbA1c [12].

II. PATIENTS AND METHODS

This cross-sectional study was conducted among 100 patients attended the Medical City / Baghdad of the hospital in eight months of which 76 % of diabetes patients were with type 2 and 24% of diabetes patients were with type 1. Adherence to therapies is supposed to be affected by socio-demographic, clinical and other factors [13]. We used a planned questionnaire that have five parts: socio-demographic (gender, age, occupation state, education level, marital status and monthly income), clinical characterizations of patients and drug feature (type of diabetes mellitus, duration of diabetes, age at onset of DM, type and duration on DM drugs, number of oral hypoglycemic agents recently in use and diabetic complications), prevalence of adherence to antidiabetic medication according to Morisky scale(high ,medium or low), the relationship between sociodemographic, clinical, and other characteristics on adherence to antidiabetic medication and the most common self-reported causes for non-adherence to suggested medication . Adherence was assessed through the specific four-items Morisky Medications Adherence Scale (MMAS-4)which includes "Do you ever forget to take your medicine?"," Are you careless at times to take your medicine?"," Sometimes if you feel worse when you take the medicine, do you

stop taking it?"," When you feel better, do you sometimes stop taking your medicine?". The Morisky scale that has high reliability and validity, and the patient was considered to be adherent if he answered NO to the four questions. The score is classified as follows: 0 = high adherence, 1–2 = medium adherence, more than 2= low adherence. Simple percentage was used to describe different variables. The chi-square test was used to assess the significance of relation among groups. A p-value of 0.05 or less was considered statistically significant.

III. RESULTS

100 diabetic patients attended the Medical City / Baghdad of the hospital in eight months of which (76 %) type 2 diabetes patients and (24%) type 1 diabetes patients were enrolled in the study groups. Table I shows the socio-economic and demographic parameters among the groups in this study. Only 45 % of the patients answered 'no' to all question and were considered adherent according to the Morisky scale (Table III), while 55% of the patients were considered non adherent.

A statistically significant association was observed between participants who missed their drugs very often and the monthly income of < 500$ ($p < 0.05$). Majority of these non-adherent patients (55%) were from the lower socioeconomic levels, poor educational level and low-monthly income.

Non-adherence was highly significantly associated with many doses and numerous drugs, especially related to the forgetfulness in elderly and retired patients. (44%) of non-adherent patients were forgetting to take their medications. Many patients were not take medication due to interfere with their meal program (81%). Other patients (30%) preferred a reduction in the number of medications and about (33%) of non-adherent patients desired to minimize the frequency of medications. rapidly lifestyle and feeling busy also causing non-compliance to take medication (71%). Many patients hold markedly negative feelings about their prescribed drugs, often fearing that the risks of chronic use of medications outweigh any desirable benefits and feeling medication is not effective (49%).(20%) of participants suffered from a number of side effects relating to non-adherence to their medication.

Table .1 Sociodemographic characteristics of the diabetic patients (n = 100).

Characteristics	n(%)
Sex:	
Female	53
Male	47
Age:	
<45	6
45–60	33
> 60 years	61
Education level:	
None	56
Primary school	4
high School	19
BSc.	10
MSc	1
Marital status:	
Single	4
married	93
Divorced	3
Widowed	0
Occupation state:	
Retired	4
Housewife	36
Employed	31
Worker	29
Unemployed	0
Place of life:	
Rural	10
Urban	90
Monthly Income:	
less than100$	64
100-500$	18
500-1000$	18

Table 2
Clinical and medication characteristics of diabetic patients (n = 100).

Clinical and medication characteristics	n (%)
Type of diabetes mellitus	
Type 1	24
Type 2	76
Duration of diabetes	
<5 years	13
5–10 years	19
>10 years	68
Age at onset	
≤18	2
18-40yr	4
≥40	94
Family history	
Yes	62
No	38
Duration on DM drugs	
<1 years	14
1-5 years	23
>5 years	63
Type of DM drugs taken	
Orals only	77
Injections only	21
Both oral and injections	2
Number of OHA currently in use	
One	66
Two	34
Diabetic complications	

No	8
Yes	92
Diabetic complications (multiple responses)	
Eye complications-retinopathy	56
Hypertension	52
Neuropathy	33
Dyslipidemia	31
Kidney complications-nephropathy	24

Table 3
Adherence rate to antidiabetic therapy according to Morisky scale (n = 100).

Adherence category (Morisky score)	n (%)
High adherence (0)	45
Medium adherence (1–2)	37
Low adherence (>2)	18

Table 4
The relationship between sociodemographic, clinical, and other characteristics on adherence to antidiabetic medication

Characteristics	Adherent	Non-adherent	p-Value
Age group			
<45	10	6	0.3013
45–60	10	13	
> 60 years	25	36	
Sex			
Male	20	33	0.1210
Female	25	22	
Education level			
No/primary	23	35	0.2067
Secondary or higher	22	20	
Marital status			
Married	42	51	0.905
Single/separated/divorced/ widowed	3	4	
Type of diabetes			
Type 1	12	12	0.572
Type 2	33	43	
Diabetes duration			
<5 years	8	4	0.0048
5–10 years	0	14	
>10 years	27	37	
Modality of treatment			
OHA	32	53	0.3122
Insulin	11	10	
Both OHA and Insulin	2	0	

Table 5: Common self-reported reasons for non-adherence to recommended treatment, n = 55 No

Reasons	No. of patients (%)
Forgetfulness	24(44%)
Lack of finance	31(56%)
Interferes with my meal plan	45(81%)
Multiple medications	17(30%)
Too busy	39(71%)
Feeling drug is not effective	27(49%)
Side effects	11(20%)
Complexity of drug regimen	18(33%)

IV. DISCUSSION

This study evaluated rate of adherence to pharmacological treatment in a diabetic population and their reasons for drug discontinuation were examined. This is the first study in Iraq characterizing patients with diabetes using MMAS-4, we reported 45% of diabetic patient had high adherence, 37% of diabetic patient had medium adherence and 18% of diabetic patient had low adherence. The evidence on adherence was based on diabetic people remembrance, and consequently the real and accurate frequency of compliance might be lesser than the existing results in this study. Moreover, patients might have problems in recalling their lifestyles and medicines taking performs, but this was reduced by querying patients to remember within a period of only 2 weeks.

Our study is consistent with other study reported by Ahmad et al. which showed an adherence rate in diabetic patients (47%) while Aymen Elsous et al. showed higher rate of adherence than our research (58%) [14]. Both of these studies used diverse instruments to evaluate reported adherence, which may clarify the dissimilarities found.

In this study, it is found that females were more adherent to their medications than males, which is consistent with other research conducted among a group of diabetic patients [15]. However, these results about the sex's influence on adherence rate is conflicting with other study that has shown males more adherent to their therapies than females [16]. A possible reasons for our results, are females more likely to be interested in health care and looking for medical care to get the proper treatments than males.

Furthermore, compliance to anti-diabetic prescriptions is challenged with multifaceted regimens particularly when co- diseases exist, and subsequently men be unable to remember to takings their remedies, for instance they are tired with work. In addition, a probable higher frequency of medicines 'adverse effects might result in a low adherence among males [17].

Unpredictably, our study showed that elderly people are the most non- adherence group which may be due to the fact that elderly people do not realize the

complications of diabetes, their inability to using the internet and looking for information about diabetes, and the fact that elderly people are stubborn by their nature. However, previous study showed that elderly (≥60 years) had a good adherence to their medications. A systematic review showed by Krueger et al. reported that there was a relationship between older age (>60 years) and adherence to treatments among patients with congestive heart failure [18] . Older patients with chronic disease get appropriate support for diabetes controlling and are more conscious of the impact of glycemic control to avoid possible complications and so survive with improved quality of life [19].

Another important factor in the adherence is the educational level, higher non adherence rates were be noted among patients with no or primary education levels in comparison with patients who have high education levels, these results are consistent with other studies [20].

The adherence rate in this study was reported to be significantly higher among diabetic patients with ≤ 5 years .This result was consistent with Giemens et al. [21],which representing an reverse relationship between the patients' adherence to their medication and the duration of disease [21].

The variations in compliance rate might be related to different factors related to the socio-economic status and the treatments are not always available for that reason patients did not take their medications on time, consequently they have to get their medication from their private pockets, which burden the capability of patients to purchase medications.

We also found that the level of non-adherent patients who had negative feeling about diabetic medication is about 49%, which reflects the emotional state regarding the importance of controlling the disease or leaving it untreated. Undesirable feelings about therapies and disease are a strong reasons to poor adherence [22]. This is sufficient clear on health psychology model offered in HBM and the Theory of Planned Behaviors [23].

To improve low adherence to medication, it is important to determine the reasons why patients discontinue the use of drugs, accordingly, it is essential to educate diabetic people about the nature of disease, the advantage of treatments to be continued, which contribute to increasing adherence of patients to their medications. Many studies from United States, Europe and Africa ensured the necessary to improve patients' health awareness to increase their adherence to their medications [24]. There are several possible ways to achieve this goal through self-education for patients to understand the disease and its complications, use educational leaflets, found a public promotion and activate connections between patients and healthcare staffs [25].

To increase people‘s awareness about their medications, it is required for policies to assurance access to medications, which might decline the number of medicines prescribed and the amount of daily doses. An important strategy would be for the Iraqi Health System to offer treatments in free, fixed and slow release doses for the treatment of the most widespread chronic diseases, in addition highlighted the role of pharmacists in guiding patients about how to use and save medications contributing to adherence to prescribed treatments.

Remarkably, the strength of our work is being the first in evaluation of adherence to medication among Iraqi diabetics, which was conducted by applying a random sample of diabetic people in Baghdad. Considerably, gender, age, martial state and education level representation were taken in this research; in addition, causes for poor adherence were evaluated in this study.

The limitations of this study are the use of small sample, self-report methods to assess patients’ adherence to anti-diabetic therapies. However, Goerge et al. revealed that using an effective scale such as the MMAS, the calculated level of adherence degree is accurate subsequently the sensitivity and specificity are more than 70%. Moreover, in future large sample size are needed to assess adherence rate and factors associated with it [26].

CONCLUSION

Medication adherence level in Iraqi subjects with diabetes was relatively low compared with that of other countries. Our survey has characterized patients with poor adherence, who are good boards for interventions to improve potentially inadequate healthcare resources.

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