

Noncompliance With Antihypertensive Drugs Among Patients with Essential Hypertension in Sulaimani City

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ABSTRACT:

BACKGROUND:

Hypertension is a common chronic disease in Iraq, noncompliance with medications is one of the most important reasons for uncontrolled hypertension.

OBJECTIVE:

This study was designed to detect the percentage and the causes of noncompliance with antihypertensive drugs among the study sample.

PATIENTS AND METHODS:

A cross-sectional study was conducted during the period from August 1st 2012 to February 28th 2013, at four primary health care centers in Sulaimani city, 309 patients were included in the study. Non compliance was tested by using self reported Morisky- Green adherence scale.

RESULTS:

54.7% of the patients were non compliant with the antihypertensive drugs, (55%males and 45% females), Statistically significant factors were: young age(62.5%), female gender (63.3%), low educational level (80.5%), being unemployed (71.7%), duration of hypertension > 10 years(65.2%), and when the source of medication was from health care centers (75.6%).

CONCLUSION:

A significant percentage of the patients were non compliant with their anti-hypertensive drugs, the main causes of non compliance were patient, physician, and drugs related, respectively.

KEY WORDS: hypertension, non compliance, antihypertensive drugs.

INTRODUCTION:

Hypertension is a common systemic disease characterized by an abnormally high blood pressure, the optimal blood pressure is less than 120/80 mmHg⁽¹⁾. Hypertension is strongly associated with functional and structural cardiac and vascular abnormalities that damage the heart, kidneys, brain, vasculature, and other organs, and leads to premature morbidity and death⁽²⁾. Hypertension is a disease amenable to control by appropriate medication or adopting relevant lifestyle modifications⁽³⁾. However, a lack of knowledge about the severity of the disease and the importance of adherence to the prescribed treatment, may constitute barriers to compliance behavior⁽⁴⁾. Ensuring patients' compliance with anti-hypertensive medications and lifestyle modifications to prevent complications of hypertension remains a major challenge to public

health in many developing countries⁽⁵⁾. Non-compliance with treatment is the most important single reason for uncontrolled hypertension. Several factors, which may be patient or health system related, continue to militate against compliance behavior. Thus it is essential to identify such factors and develop strategies to improve compliance⁽⁶⁾. Compliance is defined as "the extent to which a person's behavior (taking medicines or executing lifestyle changes) coincides with medical or health advice"⁽⁷⁾. Another definition describes compliance as an act of adhering to the regimen of care recommended by the clinician and persisting with it over time⁽⁸⁾. Non-compliance on the other hand is defined as a constant neglect of treatment or advice rather than mere temporary forgetfulness⁽⁹⁾. Various factors affect patients' compliance with anti-hypertensive medications, compliance was relatively high in patients with skilled occupations, those who were health conscious and those who

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regularly honored their clinic appointments⁽¹⁰⁾. Patients' attitudes also influence their disposition to compliance behavior that attitudes such as carelessness, hopelessness and denial contributed significantly to medication non-compliance⁽¹¹⁾. Many researchers studied non compliance with antihypertensive drugs, local researches done by Samim A. Al Dabbagh et al⁽¹²⁾, Hitham Issa AL-Bama et al⁽¹³⁾ and Al- tawil NG et al, ⁽¹⁴⁾, and researches from other countries done by Al-Sowielem LS et al⁽¹⁵⁾, Elzuber AG et al⁽¹⁶⁾, & Hadi N et al⁽¹⁷⁾, all found a significant percentage of non compliance with antihypertensive drugs among the patients.

The study is designed to detect the percentage of non –compliance with medication among the hypertensive patients. To identify the causes of non –compliance with antihypertensive drugs among hypertensive patients.

PATIENTS AND METHODS:

Setting: This study is a cross-sectional study conducted during the period from 1st August; 2012 to 28th February; 2013 at four primary health care centers in Sulaimani city.

Sample size and sampling technique: data were collected by formed questionnaire, inclusion criteria: Both sexes, age range from (30 -70) years, primarily diagnosed as essential hypertension for at least one year and on treatment.

Three hundred and nine patients who fulfilled the inclusion criteria were included in the study.

Exclusion criteria: Patients were excluded from the study when they have any of the following; other chronic diseases, pregnant women, patients with secondary hypertension, age below 30 or above 70 years, newly diagnosed hypertensive patients <1 year.

The duration of the disease was divided into (1-5, 6-10 & > 10 years), the occupational state was divided into: unemployed or retired and employed. While educational level was divided into: illiterate, less than secondary school & equal to or more than secondary school achievement.

MORISKY-GREEN SCALE

Definition: four items self reported questionnaire, valid and reliable measure to detect adherence, and an efficient tool to identify patient with poor compliance with antihypertensive drugs (sensitivity 80.2%, specificity 77.3%), targeted directly for adherence counseling services⁽¹⁸⁾. Four-items questionnaire was made up of the following four questions; do you ever forget to take your medicine?, Are you careless sometimes about

taking your medicine ? When you feel better; do you sometimes stop taking your medicines? ; And if you feel worse while taking your medicine do you stop taking it? Participants who answer; yes to any of these four questions were regarded as non-compliant; and accordingly participants were divided into those who comply and those who do not comply⁽¹⁹⁾.

Reasons for non-compliance: the reasons for non-compliance were divided into three major categories, table 1.

Data analysis: Data analysis was done using the software of SPSS Version.11.5 (statistical package for social science). Inferential statistic is obtained by statistical tests of significance using chi square test, setting P value at 0.05 as a cutoff level for significance.

RESULTS:

Among 309 participants in the study, 55% were males, 45% were females, and they were young, middle age and elderly (5.2%, 44%, and 50.8%) respectively. the percentage of non compliance with the antihypertensive drugs according to the educational level was (28.2%, 62.5%, 9.3%) in illiterate, less than secondary school & equal to or more than secondary school achievement, respectively. While the results were (56%, 44%) for unemployed or retired, and employed, respectively , regarding family history, only 41.7% had positive family history of hypertension, table 2. Regarding Morisky- Green scale among the studied sample, 54.7% of the patients were found to be non-compliant with anti-hypertensive drugs, table 3. The results according to duration of disease were (32.4%, 31.4%, 36.2%) for (1-5 years, 6-10 years, and > 10 years) respectively, complications due to hypertension were absent in 68.6% , and present in 31.4% , 34% of the patients used single drug , and 66% two or more drugs, regarding the source of drugs, in 62.5% it was supplied by the primary health care centers, and private source in 37.5%. Among the patients only 44.3% had had controlled blood pressure. The reasons for non-compliance were; patients, physician, and drug related (52.1%, 35.5%, 12.4%) respectively, table 4. When the variables (socio-demographic and clinical) have been tested using chi-square test to detect association with Morisky-Green scale, some of them were found to be statistically significant and others were not, table 5. Age, was significantly associated with MG scale, young patients were less compliant with anti-hypertensive drugs; (young, middle age and elderly), (62.5%, 52.2%, 37.6%),

respectively. Sex variable was also significantly associate with MG scale, males were more compliant with anti-hypertensive drugs than females; (52.4%, 36.7%) respectively, table 6. The relation of educational level to non compliance was highly significant statistically, (equal to or more than secondary school, below secondary school and illiterate), (24.1%, 46.7%, 80.5 %) respectively table 7. The occupational status was highly associated and statistically significant with MG scale, those who were employed were more compliant with anti-hypertensive drugs than unemployed group, (66.9% , 28.3%) respectively, table 8. There was no significant relation (p value >0.05) between family history of hypertension, and MG scale when tested by chi-square test, but the relation was significant

between the duration of hypertension and MG scale among study sample, compliance was better when duration of hypertension was less than 10 years, (54%, 48.4%, 34.8%), (1-5, 6-10 and > 10 years) respectively, table 9. The presence of complications due to hypertension, was not significantly associated with compliance, P value= 0.731. Blood pressure control as a variable was associated significantly with MG scale, table 10. The number of anti-hypertensive drugs was not significantly related to compliance P value= 0.541, but the source of anti-hypertensive drugs was highly associated and statistically significance with MG scale, compliance was better when the source of the drugs was private, rather than from health center, table 11.

Table 1: The reasons of non-compliance among the study participants.

Patient related reasons	Physician and health system related reasons	Drugs related reasons
Forgetfulness	Too busy doctor	Side effects
Taking drugs only when symptomatic	Not giving enough informations about the disease and its treatment	Cost
Feeling cured	Non-availability of drugs at PHCC	Multiple drugs to control BP
Got tired of taking medicine	Failure to make good relation with the patients	

PHCC: Primary health care centre

Table 2: The socio-demographic characteristics of the studied sample.

Variable	No.	%
Age	30-44 years old	16 5.2%
	45-61 years old	136 44.0%
	62-70 years old	157 50.8%
Sex	Male	170 55%
	Female	139 45%
Education	Illiterate	87 28.2%
	< 2ndary school	193 62.5%
	≥ 2ndary school	29 9.3%
Occupation	Un-employed	173 56.0%
	Employed	136 44.0%
Family history Of hypertension	+ve	129 41.7%
	-ve	180 58.3%
Total	309	100.0%

Table 3: Morisky-Green scale among the studied sample.

Morisky-Green scale	No.	%
Non-compliance	169	54.7%
Compliance	140	45.3%
Total	309	100.0%

Table 4: Clinical data about hypertension among the study sample.

Variable	Categories	No.	%
Duration	1-5 years	100	32.4%
		97	31.4%
	6-10 years	112	36.2%
		>10 years	
Complications	Yes	97	31.4
	No	212	68.6%
No. of drugs	Single drug	105	34.0%
	≥ 2 drugs	204	66.0%
Source of drugs	PHCC	193	62.5%
	Private	116	37.5%
	No		
Blood pressure	Controlled	137	44.3%
	uncontrolled	172	55.7%
Reason for non-compliance	Patients	88	52.1%
	Physician	60	35.5%
	Drugs	21	12.4%
Total		309	100.0%

PHCC: primary health care center, BP; blood pressure

Table 5: The relation between age variable and MG scale.

Age	MG scale				Total
	Compliance		Non-compliance		
	No.	%	No.	%	
30-44 years old	6	37.5%	10	62.5%	16
45-61 years old	65	47.8	71	52.2%	136
62-70 years old	98	62.4%	59	37.6%	157
Total	169		140		309

df= 2 $\chi^2= 8.30$ p value <0.05

Table 6: The relation between sex variable and MG scale.

Sex	MG scale				Total
	Compliance		Non-compliance		
	No.	%	No.	%	
Male	89	52.4%	81	47.6%	170
Female	51	36.7%	88	63.3%	139
Total	140		169		309

Df =1 $\chi^2= 7.57$ p value <0.05

Table 7: The relation between educational level and MG scale.

Educational level	MG scale				Total
	Compliance		Non-compliance		
	No.	%	No.	%	
Illiterate	17	19.5%	70	80.5%	87
< 2ndary school	101	53.3%	92	46.7%	193
≥ 2ndray school	22	75.9%	7	24.1%	29
Total	140		169		309

df= 2 $\chi^2= 38.08$ p value <0.00001

Table 8: The relation between occupational state and MG scale.

Occupational state	MG scale				Total
	Compliance		non-compliance		
	No.	%	No.	%	
Unemployed	49	28.3%	124	71.7%	173
Employed	91	66.9%	45	33.1%	136
Total	140		169		309

df=2 x²= 45.75 p value<0.00001

Table 9: The relation between the duration of hypertension and MG scale among the study sample.

Duration of hypertension	MG scale				Total
	Compliance		Non-compliance		
	No.	%	No.	%	
1-5 years	54	54.0%	46	46.0%	100
6-10 years	47	48.4%	50	51.6%	97
>10 years	39	34.8%	73	65.2%	112
Total	140		169		309

df=2 x²= 8.40 p value < 0.05

Table 10: The relation between blood pressure control and MG scale among study sample.

Blood pressure Control	MG scale				Total
	Compliance		Non-compliance		
	No.	%	No.	%	
Controlled	113	82.5%	24	17.5%	137
Uncontrolled	27	15.7%	145	84.3%	172
Total	140		169		309

df= 1 x²= 137.25 p value<0.00001

Table 11: The relation between source of anti-hypertensive drugs and MG scale among study sample.

Source of anti-hypertensive drugs	MG scale				Total
	Compliance		Non-compliance		
	No.	%	No.	%	
PHCC	47	24.4%	146	75.6%	193
Private supply	93	80.2%	23	19.8%	116
Total	140		169		309

df= 1 x²= 91.10 p value <0.0001
PHCC: Primary health care center

DISCUSSION:

Non-compliance is a serious problem, and should be understood as one of the major obstacles to successful treatment of hypertension; identifying the responsible factors, is therefore of vital importance in applying therapeutic strategy and in obtaining satisfactory outcome (20,21). This study revealed high percentage of non-compliance to anti-hypertensive drugs (54.7%) among participants. This rate was higher than that registered in Duhok (45.4%) , Kirkuk (34.4%) , and Baghdad (25.3%), (12,13,14). This difference could be due to variation in socio-demographic characteristics of the study sample, or using methods other than Morisky scale like; counting the remaining pills for month and/or using therapeutic

outcome method where diastolic blood pressure of < 90 was considered compliance with treatments (15). Non-compliance rate using those methods were; 44%, and 53% in two studies from Saudi Arabia (15, 22), results from other studies (Kuwait, Iran, and Sudan) were (43.6%, 60.4%, 59%) respectively (16,17,23). Non-compliance rate among participants from developed countries (18, 24) was lower than that recorded in developing countries as well as in this study from Kurdistan region of Iraq. The reason is mainly patient related (52.1%), represented by forgetfulness, and discontinuation of medication when asymptomatic. Other important reason were physician and health system related (35.5%), this results is consistent with a study done

by Balazovjeh et al⁽²⁵⁾ & a study from Saudi Arabia⁽²²⁾, but it was not consistent with other studies which were done in Iraq^(12,13). The association between socio-demographic variables and non-compliance by Morisky scale was tested using chi-square test and the results were significant between some of them but others were not. This association between such variables was consistent with other studies done in Iraq^(12,13), and other regional studies^(14,22,23), but this association between socio-demographic variables and non-compliance was not found by other western studies^(26,27,28). Hypertension is an age related disease, and the association between age and compliance is a complex relationship⁽¹⁷⁾. In this study older people were more compliant with drugs regimen than younger age groups. non-compliance was (62.5 %,52.2%, 37.6%) in age groups (30-44,45-61,62-70) years respectively. this result was consistent with previous Iraqi studies^(12,13,14), and with other regional as well as western studies^(15,18). The explanation may be that young age patients dislike taking medications which will be life-long^(29,30), on the other hand some studies were not consistent with this result^(31,27). Many studies^(12-14, 18,27) found significant association between female sex and high compliance rate to anti-hypertensive drugs. This study is not consistent with previously mentioned studies. The compliance rate among male was 52.4%, while in female was 36.7%.which is consistent with previous studies done in Saudi Arabia^(15,22), and Kuwait⁽²³⁾ as well as in other western studies^(30, 32). Other factors play a role in the compliance issue like; multiple drugs usage from variable health problems, which females may suffer from, these factors can decrease the compliance rate among female participants in this study^(12-14, 18,27). Educational level in this study has statistically significant relation with Morisky scale. Higher educational level (\geq secondary school), has been found to be associated with less non-compliance with anti-hypertensive drugs (24.1%) and the highest rate was found among illiterate participants (80.5%). This result was consistent with studies from; Iraq⁽¹³⁾, Saudi Arabia⁽¹⁵⁾, and from Ghana⁽³²⁾, but it was not consistent with studies from; Kuwait⁽²³⁾, Nigeria⁽³³⁾, and a study from Finland⁽³⁴⁾. Educated patients may have more knowledge about; the seriousness of hypertension, benefits from using anti-hypertensive drugs to control their blood pressure, and avoiding the future complications⁽³⁵⁾. Occupational status has well established relation with compliance to drugs

in many studies^(25,27, 32,34), and is inversely related with non-compliance. This finding was consistent with the present study. The rate of non-compliance was lowest among those employed 33.1%, compared to unemployed 71.7%. This may be related to economical and psychological factors, which make the employed person more cautious about his/her health. In addition to the fact that employment state represent protective factor against depression which is responsible for many cases of non-compliance to drugs regimen^(24, 34). Regarding variables other than socio-demographic, the duration of hypertension was associated significantly with Morisky scale; it was weak but still significant relation. The participants with short duration of disease have lower rate of non-compliance by Morisky scale, and the rate of non-compliance was (46.0%, 51.6%, 65.2%) in relation to duration (1-5, 6-10,>10) years respectively. This result was inconsistent with previous studies from Iraq⁽¹²⁻¹⁴⁾, and other regional studies⁽¹¹⁻³⁶⁾, but it was consistent with studies from Brazil⁽³⁷⁾, and Italy⁽³⁸⁾. The explanation may be that hypertension is asymptomatic so patient compliance decreases with time. Regarding complications due to hypertension disease, the relations was not statistically significant with MG scale by chi-square test, however non-compliance was higher among participants with complications than those with no complication (58.8%, 52.8%) respectively, this result is consistent with studies from Brazil⁽³⁷⁾, and from Kuwait⁽²³⁾, but it was not consistent with previous Iraqi studies^(12,13), and other western studies^(18,24). The explanation is; patients who have had complications may feel that the drugs did not protect them. The control of blood pressure as a variable was significantly associated with Morisky scale; compliance with anti-hypertensive drugs, was associated with better control of blood pressure. This result was logically acceptable, and supported by many studies whether regional^(12,16), or western^(24,35). The rate of non-compliance reached 84.3% among participants with uncontrolled blood pressure, while it was only 17.5% among those with controlled blood pressure. However the number of anti-hypertensive drugs used to control blood pressure, was not significantly associated with Morisky scale among the study participants, which was inconsistent with previous studies from Iraq⁽¹²⁻¹⁴⁾. The study found another significant association between the source of drugs (whether private or from PHCC), and non-compliance rate by Morisky scale, this result was supported by

other studies from Ghana⁽³²⁾, Iran (17), and other western countries^(39,40), the explanation is related to the economical issue of patients, and the health systems responsibility regarding the availability & the quality of drugs, that may lead to uncontrolled blood pressure, and complications of hypertension.^(32,41)

CONCLUSION:

1. The non-compliance with anti hypertensive drugs was significant.
2. Most common reasons for non-compliance were: forgetfulness; other important reasons were physician, and health system related like; non-availability of drugs, Lastly drugs related reason mainly caused by drugs side effects.
3. Factors which decreased the rate of non-compliance were; olde age, male sex, higher educational level, being employed, short duration of the disease, controlled blood pressure, and private source of medications.
4. Statistically non significant factors were; family history of hypertension, number of antihypertensive drugs, and complications related to hypertension.
5. Compliance is an important factor related to optimal blood pressure control.

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