

# Drug Compliance Among Hypertensive Patients; an Area Based Study

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**Aim:** To estimate the compliance rate, associated factors, status of blood pressure control and reasons for non-compliance among patients on treatment for hypertension.

**Methods:** Patients attending the hypertension clinic of Hadiya center were followed up for at least 6 months. They are labeled as uncontrolled if the mean of three consecutive measures of systolic blood pressure was  $\geq 140$  mm Hg and /or mean diastolic blood pressure was  $\geq 90$  mmHg. Hadiya family practice center in Ahmadi health district in Kuwait. One hundred fifty four hypertensive patients were included in the study. Compliance, demographic variables, duration of hypertension, presence of complications, patient knowledge of hypertension, status of blood pressure control and reasons for non-compliance.

**Results:** Out of 154 subjects recruited, 132 completed follow-up of 6 months, of whom 84 (64%) had uncontrolled hypertension. Seventeen percent of the uncontrolled hypertensives were non-compliant by pill count as compared to 2% of the controlled hypertensives ( $p < 0.05$ ). The compliance rate was 88.6%. Non-compliance was associated with lack of knowledge about hypertension ( $p < 0.05$ ). There was no statistically significant difference in the demographic variables, duration of hypertension and presence of complication rates between compliant and non-compliant hypertensives. Reasons for non-compliance included forgetfulness, drugs side effects, shortage of drugs, poly pharmacy and the asymptomatic nature of hypertension.

**Conclusion:** The compliance rate was high in this study and was accompanied by inadequate blood pressure control among non-compliant subjects. Non-compliance was associated with lack of knowledge about hypertension. This calls for increasing the patient's awareness of the diagnosis and the need for compliance with medication to achieve control of hypertension in the community.

**Key words:** Blood pressure control, compliance, hypertension.

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## INTRODUCTION

Hypertension (defined as a blood pressure  $\geq$  (systolic/ diastolic) 140/90mmHg) (1-3) is an internationally common disease (4) and an important treatable public health problem (5-7). It is a major risk factor and a powerful predictor of cardiovascular morbidity and mortality (7-10) with proven benefits after treatment (11-13). Control of hypertension protects against stroke, congestive cardiac failure, and all other causes of mortality (8, 9). In Kuwait, the most recent data on hypertension showed a prevalence rate of 26.3% (14). The percentage of blood pressure control in Kuwait was ranging from 27% - 40% in different primary health care centers (15) which can be improved by pharmacological means and modifications of life style (11). Developments in antihypertensive therapy have been associated with marked reductions in morbidity and mortality from hypertension (11-13, 16-19). But the effectiveness of

treatment for hypertension is hampered greatly by the problem of non-compliance with ingestion of drugs (20-34). In one study a drug non-compliance rate was 34% and this was the strongest predictor of poor blood pressure control (20). In Eastern Sudan it was found that 92% of compliant patients had controlled blood pressure in comparison with 18% of non-compliant patients (35).

The objective of this study was to estimate the compliance rate, factors associated with it and reasons for non-compliance among hypertensive patients.

## MATERIAL AND METHODS

### Subjects

Hypertensive patients (n=154) attending the hypertension clinic of Hadiya center and receiving medications were included in the study. This number represents 75% of the total hypertensive patients registered in the clinic. Hadiya center is the only family medicine center in Ahmadi health district. It has an established hypertension clinic with a registry. These subjects were followed for at least 6 months.

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**Table 1. Compliance rate according to demographic variables**

Variables	Total (n:132), (%)	Compliant (n:117), (%)	Non-compliant (n:15), (%)	p- value
Age mean (SD)		54.4 (9.9)	55.1 (9.8)	0.739
Sex				
Female	79 (59.8)	72 (61.5)	7 (46.7)	0.269
Male	53 (40.2)	45 (38.5)	8 (53.3)	
Marital status				
Currently married	28 (21.2)	25 (21.4)	3 (20)	0.903
Unmarried (single, widow, divorced)	104 (78.8)	92 (78.6)	12 (80)	
Nationality				
Kuwaiti	115 (87.1)	103 (78)	12 (9.1)	0.382
Non Kuwaiti	17 (12.9)	14 (10.6)	3 (2.3)	

All above p-values were based on chi-square test, except in Age, the independent t-test was used.  
SD= Standard deviation.

### Setting and measurements

During this time three blood pressure (BP) measures were taken in an interval of at least 4 weeks after patients being maintained on their medication for at least 3 months. Measurements began after 5 min of quiet rest and were made with a mercury sphygmomanometer with the patient seated. A cuff, of suitable size, was used. The systolic blood pressure was taken at korotkoff phase I and the diastolic blood pressure was taken at korotkoff phase V (1). Patients were labeled as uncontrolled hypertensives if the mean of three measures of systolic blood pressure (SBP) was  $\geq 140$  mmHg and /or diastolic blood pressure (DBP) was  $\geq 90$  mmHg (1-3). Factors of non-compliance studied include demographic information, age, sex, marital status, nationality, duration of hypertension, patient knowledge of hypertension and whether they had complications (such as neurological, cardiac or renal ones). Patient's non-compliance with antihypertensive drugs, was measured at the end of follow-up, by asking the patient and by doing a pill count. Subjects who had consumed less than 80% of the prescribed drugs were labeled as being non-compliant (20). Non compliant patients were asked about the reasons for their non-compliance with drugs. Compliant patients with uncontrolled blood pressure were asked about their attitude towards the change of their medication and whether they were informed by their treating doctor about the need for such a change.

### Statistical analysis

Data were collected and analyzed using the statistical package for social sciences (SPSS). The chi-square test was used to compare

categorical variables like sex, marital status, nationality and knowledge of BP in the two groups of compliant and non-compliant hypertensives. The two sample t-test was used to compare the mean of age.  $P \leq 0.05$  was used as the cut-off level for statistical significance.

### RESULTS

Of the 154 subjects recruited into the study, 132 completed follow-up period of 6 months. Of the 132 subjects who completed follow-up, 84 (64%) subjects had uncontrolled hypertension. The mean age of subjects was 54 (SD $\pm$ 9.8) years and the female to male ratio was 1.3:1. Married patients amounted to 21.2% of the total sample; the rest were single, divorced or widowed. Kuwaiti nationals constituted 87.1% of the sample (Table 1). The duration of hypertension was less than 5 years for 51 (38.6%) patients and 5 years or more for the rest. Fourteen (10.6%) patients had complications (such as neurological, cardiac or renal ones). Patient knowledge of hypertension was good in 90 (68.2%) patients; while it was poor in the rest (Table 2). There was no statistically significant difference in the mean age, sex distribution, marital status, nationality, duration of hypertension or presence of complications in compliant and non-compliant subjects (Table 1-2). There was significant difference in the patient's knowledge of hypertension in compliant and non-compliant hypertensives ( $p < 0.05$ ) (Table 2). Non compliant hypertensives were ignorant about the fact that hypertension is a chronic disease.

The overall compliance rate was 117 (88.6%). One out of 48 (2%) of controlled hypertensives was non-compliant by pill

**Table 2. Compliance rate according to illness factors**

Variable	Total (n:132)	Compliant (n:117)	Non-compliant (n:15)	p- value
Duration of hypertension				
< 5 years	51 (38.6)	44 (33.3)	7 (5.3)	0.497
≥ 5 years	81 (61.4)	73 (55.3)	8 (6.1)	
Complications				
Present	14 (10.6)	13 (9.8)	1 (0.8)	0.599
Not present	118 (89.4)	104 (78.8)	14 (10.6)	
Patient knowledge of hypertension				
Good	90 (68.2)	84 (71.8)	6 (40)	0.013
Poor	42 (31.8)	33 (28.2)	9 (60)	

Values are expressed as numbers (percentages).

count as compared with 14 out of 84 (17%) of uncontrolled hypertensives. This difference was statistically significant ( $p < 0.05$ ). Reasons for non-compliance included forgetfulness, drug side effects, shortage of drugs, polypharmacy and the asymptomatic nature of hypertension and the frequency of each is shown in Table 3. 38.2% of compliant patients with uncontrolled blood pressure were hesitant to any change in their medication, 32.4% were informed by their doctors for the necessity to change the medication and only 23.5% of patients their medication was changed by the treating doctor for better control.

## DISCUSSION

Our study investigated the status of blood pressure control among compliant and non-compliant subjects. Non-compliance was a significant predictor for uncontrolled hypertension. This finding is to be expected, because non-compliance tends to be associated with poor control of hypertension. This result is supported by different studies that considered compliance to be the most important factor for poor BP control (20-34). We found a drug compliance rate of 88.6% at the end of follow-up and this was high compared with other studies (36,37). Nevertheless the population of non-compliant and uncontrolled hypertension formed about

17% of our study population and would be an ideal target for health education.

The patient's knowledge and awareness of hypertension was significantly associated with compliance to medication for hypertension. This stresses the importance of health education to increase the knowledge of hypertension and its sequelae to improve patient's non-compliance behavior. The relationship between health knowledge and compliance was supported in some studies (23,36) but not in others (38,39). Data in literature suggested that patients who knew about the importance of compliance had a significantly higher compliance rate than did those who had been ignorant of that aspect (36). Other literature revealed relatively little support for a strong relationship between health knowledge and medication compliance (38,39).

Our study showed no significant relationship between demographic features and the compliance rates. Regarding this aspect reports differ on the nature of such associations. In one study compliance was associated positively with male sex, and negatively with older age (36) while in other study compliance was associated negatively with younger age and male sex (38). Other study showed no statistical significant difference in the demographic features in compliant and non-compliant subjects (29). More than half of the non-compliant patients in our study reported forgetfulness and absence of symptoms of hypertension as reasons for their non-compliance. Other reasons reported were presence of drugs side effects and drugs out of supply. These findings are similar to those of other authors (36, 40). In one study, almost one-half of the non-compliant patients reported absence of symptoms of hypertension and forgetfulness

**Table 3. Reasons for non-compliance among 132 hypertensive patients**

Reasons for non-compliance	
Forgetfulness	8 (53.3)
Presence of drugs side effects	5 (33.3)
Drugs out of supply	4 (26.7)
Polypharmacy	1 (6.7)
Absence of symptoms	1 (6.7)

as reasons for their non-compliance (36). This calls for more focus and care regarding the behavioural aspects of the management of hypertension (41) rather than restricting doctor's attention to the choice of one type of drug or another. Ignoring behavioral aspects of the management of patients could lead to unnecessary and harmful escalation of a drug regimen (37).

Regarding the compliant patients with uncontrolled BP, more than one third of them were hesitant to any change in their medication. This calls for more focus and care regarding the behavioral aspects of the management of hypertension. For the same group of patients only 23.5% of them their medication was changed by the treating doctor for better control. This reflects sub optimal medical regimen, which is considered in some studies to be the most common cause of uncontrolled hypertension (42, 43).

In conclusion, the study has revealed a high compliance rate with antihypertensive medications. It also demonstrates that compliance is an important factor related to optimal blood pressure control. This requires doctors to orient themselves towards patients' behaviors that may interfere with compliance with therapy, in order to achieve control of hypertension in the community. It is also recommended that health education should be stressed to improve the rate of compliance by improving patient's knowledge about hypertension and its sequelae.

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