

## Original Research Article

# Knowledge and practice on drug compliance among hypertensive patients in field practice area of a tertiary health care institute in Haryana

Navraj Singh\*, Meena Rajput, Pardeep Khanna, Kanika Bansal, Ravish Ranjan, Manpreet Kaur

Department of Community Medicine, Pt. B.D. Sharma PGIMS, Rohtak, Haryana, India

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### \*Correspondence:

Dr. Navraj Singh,

E-mail: [dr.navraj79@gmail.com](mailto:dr.navraj79@gmail.com)

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## ABSTRACT

**Background:** Hypertension contributed 1.6 million deaths and 33.9 million disability-adjusted life years lost in 2015. It has been documented that decrease in systolic BP by 10 mm Hg leads to 22% reduction in CHD and 41% reduction in stroke, which can be achieved by better drug compliance. Knowledge of patients regarding hypertension and its associated complications and drug compliance in hypertension is the key to achieve compliance to medication and control of blood pressure. Aim of study was to find out the proportion of drug compliance among hypertensive patients and to identify various factors associated with non-compliance to drugs.

**Methods:** Descriptive, cross-sectional study was done in out-patient departments of Community Health Centre Dighal and Civil Hospital Beri. 400 follow up patients of hypertension who were 30 years and above taking treatment of hypertension from last 1 year, attending OPD. Medication adherence was assessed using Morisky medication adherence scale (MMAS-8).

**Results:** 72.5% study subjects showed low level of adherence. Low adherence was maximum in the age group of 51-60 years (77.6%) and most common reason for non-compliance to drugs was observed to be forgetfulness (59.3%). Patients unaware of the complications were having low adherence to medication as compared to counterpart and this association was observed to be statistically significant ( $p \text{ value} \leq 0.05$ ).

**Conclusions:** The result of this study is of value to health care providers to prevent treatment failure due to noncompliance and prevent premature deaths.

**Keywords:** Adherence, Antihypertensive medication, Drug compliance

## INTRODUCTION

Hypertension is an important public-health problem worldwide because of its high magnitude and associated risk of complications. It is the third most common cause of loss of disability-adjusted life-years (DALYs).<sup>1</sup> According to the Joint National Committee 8 (JNC 8) criteria, experts recommend goal of blood pressure less than 150/90 mmHg for hypertensive patients of age 60 years or above and blood pressure less than

140/90 mmHg for hypertensive patients of age less than 60 years. Moreover, for hypertensive patients of all ages with diabetes and /or chronic kidney disease, blood pressure should be less than 140/90 mm Hg.<sup>2</sup>

In terms of burden of disease, 333 million hypertensive patients are from developed countries while 639 million from developing countries.<sup>3</sup> Hypertension contributed 7% DALYs and 9.4 million deaths globally in 2010.<sup>4</sup> It has been documented that decrease in systolic BP by

10 mmHg leads to 22% reduction in CHD and 41% reduction in stroke.<sup>5</sup> Studies have indicated that 1.6 million deaths and 33.9 million disability-adjusted life years lost in 2015 were due to hypertension and it is the most important cause of mortality as well as disease burden in India.<sup>6</sup>

WHO defines the compliance to long term medical treatment as person's behavior to what extent he/she responds to taking medication, follows diet, lifestyle changes and response to recommendations from healthcare providers. Adherence to drug therapy for hypertension varies from 43-88% worldwide depending on population under study, duration of follow up and compliance assessment. Compliance for practical purpose is usually defined as consuming 80% of doses of prescribed medication correctly.<sup>7</sup>

Knowledge of patients regarding drug compliance in hypertension and its complications as well as their practice is the key to achieve compliance to medication and control of blood pressure. Patients with knowledge of hypertension and its associated complications such as cardiovascular, cerebrovascular, visual and renal are found to be more drug compliant.<sup>8,9</sup> The aim of this study was to assess the knowledge of drug compliance, factors associated with it and the reasons for non-compliance among hypertensive patients.

## METHODS

The study was descriptive, cross-sectional conducted in out-patient departments of Community Health Centre, Dighal and Civil Hospital, Beri (District Jhajjar) which are rural field practice areas attached to the Department of Community Medicine, Pt. B. D. Sharma PGIMS, Rohtak. Sample size was calculated to be 400 using  $4pq/l^2$  (P as prevalence of compliance for hypertensive drugs in previous study (Durai et al) i.e. 50%,  $q=1-p$  and absolute error of 5%).<sup>9</sup>

### *Sampling technique and data collection*

400 follow up patients of hypertension who were 30 years and above taking treatment of hypertension from last 1 year, attending OPD of Community health centre Dighal and Civil hospital Beri on the day of visit of investigator were recruited in the study. Patients with co-morbidities like diabetes, cancer, psychiatric illnesses who were seriously ill and did not give consent were excluded.

The permission from institutional ethics committee was obtained before the commencement of the study. The interview schedule was explained in patient's vernacular language and confidentiality of the information obtained was maintained. Data was collected using pre-designed, pre-tested, semi-structured interview schedule by the investigator himself.

The interview schedule comprised of socio-demographic characteristics, knowledge of drug compliance and reasons for non-compliance. The socio-economic status of the patients was assessed using Modified B.G. Prasad Socio-economic Scale.

Medication adherence was assessed using Morisky medication adherence scale (MMAS-8). The MMAS-8 is considered the most commonly used self-reporting method to determine adherence to drug. The scale consists of eight questions, first seven items having a closed dichotomous answer (yes/no) that indicates adherent or non-adherent behavior, out of seven questions, the six questions must be answered negatively and only one positively. Item number 8 was answered in term of 5-point Likert scale, expressing how often the patient did not take his medications: never, almost never, sometimes, often and always. Total MMAS-8 scores of patients ranged from 0 to 8. According to scores obtained by the patients, they were categorized in to 3 levels of adherence.<sup>10</sup>

**Table 1: MMAS-8 scores of patients.**

MMAS-8 score	Adherence level
8	High adherence
6 and <8	Medium adherence
<6	Low adherence

Data collected was entered in the MS Excel spread sheet and analyzed using Statistical Package for Social Sciences (SPSS) software version 20.0. Chi square, spearman rho and kruskal wallis tests were applied wherever necessary and the interpretation was made. p value of <0.05 was considered critical for statistical significance.

## RESULTS

52.3% study participants were females and 47.7 % were males. 48% participants were in the age group of >60 years and 60.8% were of General category. 47.5% participants were illiterate, 19% were educated up to primary level followed by middle class education in 14.2%. Only 6.8% were graduate. As per Modified B.G Prasad socio-economic scale, 40.3% belonged to lower class followed by lower middle (25.8%), middle (15.2%), upper middle (14.7%) and upper (4%). 71.8% study subjects had 5-10 family members. 73% had no family history of hypertension. 77.7% were diagnosed with hypertension 1 to 5 years back. Only 4.6% were diagnosed with raised blood pressure for more than 10 years. 81.5% of study subjects were taking treatment since 1 to 5 years. Only 3% were taking treatment from more than 10 years.

Low adherence was maximum in the age group of 51-60 years (77.6%) followed by 71.8% in more than 60 years. The association between age and level of adherence was not statistically significant ( $p=0.702$ ).

**Table 2: Socio-demographic profile of study subjects according to level of drug adherence (n=400).**

Socio-demographic variables	Score grading			Total (n=400)	P value
	Low Adherence n=290 (%)	Medium Adherence n=84 (%)	High Adherence n=26 (%)		
<b>Age (years)</b>					
30-40	19 (63.3)	10 (33.3)	1 (3.4)	30	0.702
41-50	50 (70.4)	15 (21.2)	6 (8.4)	71	
51-60	83 (77.6)	16 (15)	8 (7.4)	107	
>60	138 (71.8)	43 (22.4)	11 (5.8)	192	
<b>Gender</b>					
Male	140 (73.3)	35 (18.3)	16 (8.4)	191	0.729
Female	150 (72)	49 (23.5)	10 (4.5)	209	
<b>Caste</b>					
General	179 (73.7)	50 (20.6)	14 (5.7)	243	0.620
Schedule caste	74 (69.2)	24 (22.4)	9 (8.4)	107	
Backward caste	37 (74)	10 (20)	3 (6)	50	
<b>Occupation</b>					
Farmer	78 (78.7)	15 (15.3)	6 (6)	99	0.477
Labourer	44 (65.7)	19 (28.3)	4 (6)	67	
Government job	15 (79)	3 (15.7)	1 (5.3)	19	
Private job	30 (69.7)	10 (23.3)	3 (7)	43	
Business	9 (75)	2 (16.6)	1 (8.4)	12	
Jobless	23 (72)	7 (22)	2 (6)	32	
Retired	17 (60.7)	6 (21.3)	5 (17)	28	
Housewife	74 (74)	22 (22)	4 (4)	100	
<b>Education</b>					
Illiterate	149 (78.5)	32 (16.8)	9 (4.7)	190	0.009
Primary school	52 (68.4)	21 (27.6)	3 (4)	76	
Middle school	40 (70.2)	11 (19.3)	6 (10.5)	57	
Secondary education	30 (60)	15 (30)	5 (10)	50	
Graduate and above	19 (70.4)	5 (18.5)	3 (11.1)	27	
<b>Socio-economic status</b>					
Upper	11 (68.7)	4 (25)	1 (6.3)	16	0.287
Upper Middle	46 (78)	10 (17)	3 (5)	59	
Middle	37 (60.7)	16 (26.2)	8 (13.1)	61	
Lower Middle	74 (72)	22 (21.8)	7 (6.2)	103	
Lower	122 (75.7)	32 (20)	7 (4.3)	161	
<b>Duration since diagnosis (Years)</b>					
1-5 Years	228 (73.3)	60 (19.3)	23 (7.4)	311	0.712
5-10 Years	48 (68.6)	19 (27.1)	3 (4.3)	70	
>10 Years	14 (73.7)	5 (26.3)	0 (0)	19	
<b>Duration of treatment initiation (years)</b>					
1-5 Years	238 (73)	65 (20)	23 (7)	326	0.756
5-10 Years	44 (71)	15 (24)	3 (5)	62	
>10 Years	8 (66.6)	4 (33.4)	0 (0)	12	

Low level of adherence was more in males (73.3%) as compared to females (72%). The association between gender and level of adherence was also not statistically significant (p value=0.729). Study participants belonging to backward class had more low level adherence followed by general class. With increase in education level

adherence to antihypertensive drugs improved and this association was found to be statistically significant (p value=0.009). Low adherence was more in lower socio-economic group as compared to other groups but this association was not statistically significant (p=0.287). 73.7%, hypertensives diagnosed since more than 10 years

showed low level adherence to antihypertensive drug treatment while 73% participants taking treatment for 1-5 years had low compliance (Table 2). Forgetting to take medication was the main reason of drug non-compliance in 59.3% participants followed by poor knowledge of the disease and ignorance of need for long term treatment (55.5%). Very busy schedule and getting late for work was reason of non-compliance in 43.7% study participants. Poor communication with physician, insufficient patient

information/ education was reason of non-compliance in 21.3%, 17.3% participants commented non-availability/ accessibility to be the reason of their non-compliance, rest nearly 14.2% preferred taking traditional medication and 15.8 % stated, lack of reminder as the reason for drug non-compliance (Table 3). 72.5% study subjects showed low level of adherence to their treatment while 21% showed medium adherence. Only 6.5% had high level adherence to their treatment.

**Table 3: Distribution of study subjects as per reasons for drug non-compliance (n=400)**

Reasons of drug non-compliance	Yes N (%)	No N (%)	Total N (%)
Poor knowledge of the disease and ignorance of need for long term treatment	222 (55.5)	178 (44.5)	400 (100)
Too busy and or late for work	175 (43.7)	225 (56.3)	400 (100)
Forgetfulness	237 (59.3)	163 (40.7)	400 (100)
Medicine out of supply/ not easily available	69 (17.3)	331 (82.7)	400 (100)
Religious practice and cultural beliefs	45 (11.2)	335 (88.8)	400 (100)
Adverse drug reactions/side effects of medicine	45 (11.2)	335 (88.8)	400 (100)
Patient do not believe that health depends on treatment	42 (10.5)	358 (89.5)	400 (100)
Fear of addiction to medication	48 (12)	352 (88)	400 (100)
Poor communication with physician, insufficient patient information/ education	85 (21.3)	315 (78.7)	400 (100)
Expenditure on treatment	24 (6)	376 (94)	400 (100)
Interruption of daily routine	47 (11.8)	353 (88.2)	400 (100)
Away on weekend or vacations	28 (7)	372 (93)	400 (100)
Not taking treatment during alcohol intake	42 (10.5)	358 (89.5)	400 (100)
Too many medications to take	34 (8.5)	366 (91.5)	400 (100)
Prefers traditional medicine	57 (14.2)	343 (85.8)	400 (100)
Lack of reminders	63 (15.8)	337 (84.2)	400 (100)

**Table 4: Association of medication adherence with knowledge of drug compliance (n=400).**

Overall drug adherence	Low adherence	Medium adherence	High adherence	Total	$\chi^2$ , df, p value
	N (%)	N (%)	N (%)	N (%)	
	290 (72.5)	84 (21)	26 (6.5)	400(100)	-
<b>Medication not to be stopped even if their body condition was good</b>					
Aware	124 (54.9)	76 (33.6)	26 (11.5)	226 (100)	74.735,
Not Aware	166 (95.4)	8 (4.6)	0	174 (100)	1,0.000
<b>Medication not be stopped even if their blood pressure under control</b>					
Aware	108 (52.5)	73 (35.4)	25 (12.1)	206 (100)	79.014,1,
Not aware	182 (93.8)	11 (5.7)	1 (0.5)	194 (100)	0
<b>Medication not to be stopped till end of life</b>					
Aware	89 (53.3)	55 (32.9)	23 (13.8)	167 (100)	56.578,1,
Not aware	201 (86.3)	29 (12.4)	3 (1.3)	233 (100)	0
<b>Antihypertensive drugs not be doubled if they missed previous dose</b>					
Aware	125 (65.8)	45 (23.7)	20 (10.5)	190 (100)	11.773,1,
Not aware	165 (78.6)	39 (18.6)	6 (2.8)	210 (100)	0
<b>Knowledge of complication regarding noncompliance-cardiac</b>					
Aware	157 (64.9)	63 (26)	22 (9.1)	242 (100)	17.993,1,
Not aware	133 (84.2)	21 (13.3)	4 (2.5)	158 (100)	0

Continued.

Overall drug adherence	Low adherence	Medium adherence	High adherence	Total	$\chi^2$ , df,
	N (%)	N (%)	N (%)	N (%)	p value
<b>Knowledge of complication regarding noncompliance-cerebral</b>					
Aware	61 (57)	34 (31.8)	12 (11.2)	107 (100)	16.786,1
Not aware	229 (78.3)	50 (17)	14 (4.7)	293 (100)	,0.000
<b>Knowledge of complication regarding noncompliance-renal</b>					
Aware	41 (56.2)	20 (27.4)	12 (16.4)	73 (100)	16.033,1,
Not aware	249 (76.1)	64 (19.6)	14 (4.3)	327 (100)	0.001
<b>Knowledge of complication regarding noncompliance-ocular</b>					
Aware	47 (56)	24 (28.6)	13 (15.4)	84 (100)	19.0497,1,
Not aware	243 (76.9)	60 (19)	13 (4.1)	316 (100)	0
<b>Any four factors pertaining to drug compliance</b>					
Aware	72 (48)	55 (36.6)	23 (15.4)	150 (100)	65.620,1,
Not aware	218 (88)	29 (11.8)	3 (1.2)	250 (100)	0

95.4% subjects had low adherence to antihypertensive medication as they were not aware that medication should not be stopped even if body condition is good than (54.9%) subjects who were aware. Low adherence was present more (93.8%) in subjects who were not aware that medication should not be stopped even if blood pressure is under control than subjects (52.5%) who were aware. 86.3% low adherent subjects were not aware that medication should not be stopped till end of life than subjects (53.3%) who were aware while 78.6% of participants who were unaware of the fact that there is no need to take double dose of medicine if they miss previous dose showed low level adherence to medication.

Also, it was observed that those patients who were unaware of the complications like cardiac, renal or ocular were having low adherence to medication as compared to those with better knowledge and this association was observed to be statistically significant (p value <0.05). 88% of study subjects who were not aware of any four factors pertaining to drug compliance showed low level of adherence to treatment. (Table 4).

## DISCUSSION

In the present study maximum number of study participants (72.5%) was observed to have low level of adherence to the antihypertensive medications. This finding was found to be similar to the study conducted by Pirasath et al<sup>11</sup> in which low level of adherence was reported among 84.5% and another study conducted by Hema et al where 62% were having lower level of adherence.<sup>12</sup> The findings regarding adherence as reported by the study conducted by Shameena et al were in contrast to our study where lower level of adherence was reported among 47.3% study participants only.<sup>13</sup> This dissimilarity might be due to different settings of studies, as our study was conducted in rural health centres where

majority of lower socio-economic population with low literacy levels come for seeking treatment while Shameena et al conducted study in patients of tertiary care hospital.

In our study, low adherence was maximum in 51- 60 years age group (77.6%) While study conducted by Shameena et al<sup>13</sup> showed low adherence in age group of 41-50 years (53.3%). Okello et al reported in their study, maximum low adherence in age group >60 years (35.36%). In our study, 73.3% males had low level adherence to medication, similar findings were reported by Pan et al and Hema et al where 73.3% and 74.5% males had low level adherence respectively.<sup>10,12,14</sup> Low level adherence was present more in backward caste (74%) followed by 73.7% in general caste subjects. Ranjan et al in Uttar Pradesh showed that low compliance was 54.5% in general caste and 45.5% in schedule /backward caste as they had taken only 89 subjects and haven't used MMSA scale for adherence measurement.<sup>15</sup> In present study, Government job subjects were showing low adherence to treatment (79%) followed by farmers (78.7%), whereas Ambaw et al in Ethiopia showed 25% of students were having low adherence to treatment.<sup>16</sup> This might be due to hectic busy schedule of working population in comparison to those who were unemployed. In our study, 78.5% illiterate showed low adherence to treatment which is similar to study conducted by Hema et al (73.6%) and Pan et al (72.6%), whereas study by Shameena et al revealed that 54.8 % illiterate showed low adherence to treatment. This difference again may be due to different study population.

In present study, low level adherence was highest in upper middle socio-economic group (78%) followed by lower class (75.7%) similarly study conducted by Hema et al showed low adherence was maximum in upper class (66.4%) followed by lower class (59.6%) while study

carried out by Shameena et al revealed low adherence was maximum in middle socio-economic status subjects (75%) followed by lower class (53.5%). This might be due to different education level and economic conditions of studied subjects.<sup>12</sup>

73.7% participants with more than 10 years duration since diagnosis of hypertension showed low level adherence to antihypertensive drug treatment while Pan et al observed 61.5% low adherence among >10 years of diagnosis of hypertension. 73% participants having treatment for 1-5 years showed low adherence to hypertensive drug treatment.<sup>17</sup> Results of our study were similar to study carried out by Pan et al which revealed that low adherence was highest 85.19% in subjects who were on treatment of hypertension for less than 5 years.<sup>14</sup>

In the present study as the education level improved low compliance to antihypertensive drugs decreased and it was significantly associated ( $p < 0.05$ ). Similar significant association between education and adherence level was observed by Shameena et al in Mangalore and Okello et al in Uganda.<sup>10,13</sup> The other factors namely age, gender, caste, socioeconomic status was not significantly associated with level of adherence. This finding was in contrast to that observed by Shameena et al in Mangalore where statistically significant association was observed between gender, religion, marital status, occupation, socioeconomic status and level of adherence.

Most common reason for non-compliance to drug was observed to be forgetfulness (59.3%), similar finding shown by Durai et al (33.3%) whereas the finding of this study were in contrast to the study conducted by Pirasath et al and Malik et al where forgetfulness accounted for non-compliance in only 23.1% and 7.3% study participants respectively.<sup>9,11,18</sup> This dissimilarity may be due to subject's perception about seriousness of the disease.

Regarding knowledge of complications due to non-compliance with drugs it was observed that those patients who were unaware of the complications like cardiac, renal or ocular were having low adherence to medication as compared to those with better knowledge and this association was observed to be statistically significant ( $p$  value  $\leq 0.05$ ). The study conducted by Durai et al also reported the similar finding of statistically significant association.<sup>9</sup>

## CONCLUSION

This study revealed that those study participants who were aware about the various complications of hypertension showed high adherence than subjects who were not aware. Subjects having good knowledge of hypertension and its treatment were more compliant than those who were unaware. It is concluded that good knowledge of hypertension and its complications play a major role in medication adherence. Education level of

patients is also a major aspect to determine the drug adherence among hypertensive cases.

## Recommendations

Recommendations of the present study are that health professionals must educate hypertensive patients about their disease, their medications and the consequences of noncompliance to prevent treatment failure and premature deaths. This decreases economic burden to both individuals and the Nation. Combined educational and behavioural approach with continuous motivation increases drug compliance.

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