

# Frequency of Poor Adherence to Antihypertensive Treatment and an Analysis of Clinico-demographic Correlates

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## ABSTRACT

This observational study is aimed to determine the frequency of poor compliance to antihypertensive treatment and to identify predictive demographic factors. One hundred and six hypertensive patients, on treatment for more than three months, were enrolled. Demographic characteristics (age, gender, level of education, duration of hypertension and area of residence) were recorded. Number of antihypertensive as well as total medicines, presence of any co-morbid conditions, possible side effects to treatment and financial source for obtaining medications were also enquired. Blood pressure was measured and body mass index was calculated. Compliance was assessed with 4-Item Morisky Medication Adherence Scale. Poor compliance (scores  $\leq 2$ ) was present in 31 (29.25%) patients. Systolic and diastolic blood pressures were higher in poorly compliant patients. Patients with co-morbid conditions were more likely to have poor compliance (OR=4.238; 95% CI 1.161, 15.468). Other variables did not have a significant association with compliance to treatment. Poor compliance is fairly common in hypertensive patients and should be looked after for more so in patients with co-morbid conditions.

**Key Words:** *Patient compliance. Therapy. Hypertension.*

Hypertension is a major chronic health condition and an important risk factor for Coronary Heart Disease (CHD). Targeting hypertension is an essential step in reducing the prevalence of CHD. Achieving adequate control of blood pressure is not always easy. Even in industrialized nations, only 32% of hypertensive patients have their blood pressure controlled to the conventionally recommended targets.<sup>1</sup> Poor compliance to medications is one of the possible reasons. A wide range of figures have been quoted for rates of compliance across different studies. Addressing poor compliance requires recognition of predictive factors, so that stronger emphasis can be placed on a select group of patients. This study was, therefore, done to determine the frequency of poor compliance to antihypertensive treatment amongst patients from Bagh, Azad Kashmir; and to identify possible factors that could indicate an increased risk.

This prospective observational study was carried out at 1-Mountain Medical Battalion (Bagh, Azad Kashmir) from August to October 2014. Ethics Review Committee of the Institute approved data collection protocol. Hypertensive patients, reporting to the medical outdoor clinic for the first time during this period, were included, subject to provision of informed verbal consent. Those

on antihypertensive treatment for less than 3 months were excluded. Demographic characteristics, including age, gender, level of education, duration of hypertension and area of residence (rural/urban) were recorded. The number of antihypertensive as well as total medicines, presence of any co-morbid conditions, possible side effects to treatment and financial source for obtaining medications were also enquired from the patients. Body Mass Index (BMI) was calculated after measuring height and weight using standard techniques. Blood pressure was measured in a sitting position using mercurial sphygmomanometer. Medication adherence was assessed using Morisky Medication Adherence Scale (MMAS). This brief questionnaire has a high reliability and validity, which has been particularly useful in chronic conditions such as hypertension. It contains four questions, answered yes or no. Each 'no' response gets one mark, so that the total score ranges from 0 (non-adherence) to 4 (high adherence). All patients were verbally asked these four questions by a single physician and the total score was calculated. Scores 3 - 4 indicated good compliance, whereas lesser ones indicated poor compliance.

Statistical analysis was done with STATA version 12.0. Quantitative variables were described as mean  $\pm$  standard deviation. Frequency of patients with poor compliance to treatment was calculated. Binary logistic regression was carried out to study the association of age, gender, level of education, duration of hypertension, number of antihypertensive as well as total medicines, presence of any co-morbid conditions, possible side effects to treatment, financial source for obtaining medications and BMI with poor compliance.

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Systolic and diastolic blood pressures were also compared amongst patients with different grades of adherence using independent samples t-test. For all statistical tests,  $p < 0.05$  was considered significant.

A total of 106 patients were enrolled for this study, consisting of equal proportion of males and females, and having a mean age of  $58.81 \pm 12.26$  years. The median level of education was 4 years (range 0 - 16 years) whereas the median duration of hypertension was 5 years (range 1 - 40 years). MMAS scores  $< 3$  were seen in 31 (29.25%) patients, indicating poor compliance. Systolic blood pressures were  $145.40 \pm 19.15$  mmHg and  $155.68 \pm 24.15$  mmHg amongst patients with good and poor compliance ( $p=0.040$ ; statistically significant difference), whereas diastolic blood pressures were  $86.67 \pm 11.07$  mmHg and  $91.29 \pm 9.57$  mmHg amongst these two categories respectively ( $p=0.035$ ; statistically significant difference). Patients with co-morbid conditions were more likely to have poor compliance (OR=4.226; 95% CI 1.157, 15.437;  $p=0.029$ ). None of the other variables shown in Table I had a statistically significant association with degree of compliance to medical therapy.

Clinicians are often concerned about medication compliance; not only because it is a determinant of response as well as adverse clinical outcomes associated with the primary disease; it adds upto the healthcare costs as well. It may be practically difficult or even impossible to assess compliance directly in most patients. To overcome this problem, several scales have been designed to measure compliance indirectly. They differ mainly with regard to length and thus the time needed to administer them for internal consistency and reliability. MMAS has been used for this study, considering its short-length and the ease of administration. It has also been shown to have moderate to high test- retest reliability and criterion validity in some studies, which means that repeat testing would give similar results and that the questionnaire assesses adherence very much as it is supposed to do. This scale is thus a reasonable option to promptly and consistently detect patient's non-adherence in outdoor clinics.

This study has revealed lower rates of poor compliance to antihypertensive treatment as compared to statistics quoted in other national studies in the past. Almas *et al.* have described non-compliance rates of 43% (86 out of

**Table I:** Predictors of poor compliance to antihypertensive treatment.

Variable	Good adherence	Poor adherence	Adjusted OR (95% CI)	p-value
Age				
$\leq 60$ years	41 (54.67%)	20 (64.52%)	1.00	0.693
$> 60$ years	34 (45.33%)	11 (35.48%)	0.778 (0.223, 2.710)	
Gender				
Female	37 (49.33%)	16 (51.61%)	1.00	0.466
Male	38 (50.67%)	15 (48.39%)	1.638 (0.434, 6.185)	
Education				
$\leq 4$ years	38 (50.67%)	16 (51.61%)	1.00	0.516
$> 4$ years	37 (49.33%)	15 (48.39%)	0.697 (0.234, 2.072)	
Duration of hypertension				
$\leq 5$ years	47 (62.67%)	18 (58.06%)	1.00	0.914
$> 5$ years	28 (37.33%)	13 (41.94%)	1.053 (0.410, 2.702)	
Residence				
Urban	17 (22.67%)	10 (32.26%)	1.00	0.767
Rural	58 (77.33%)	21 (67.74%)	0.847 (0.282, 2.544)	
Number of anti-hypertensive medicines				
1	26 (34.67%)	14 (45.16%)	1.00	0.898
$> 1$	49 (65.33%)	17 (54.84%)	1.073 (0.364, 3.162)	
Number of total medicines				
$\leq 3$	39 (52.00%)	19 (61.29%)	1.00	0.114
$> 3$	36 (48.00%)	12 (38.71%)	0.384 (0.117, 1.259)	
BMI				
$\leq 25$ kg/m <sup>2</sup>	45 (60.00%)	11 (35.48%)	1.00	0.123
$> 25$ kg/m <sup>2</sup>	30 (40.00%)	20 (64.52%)	2.444 (0.784, 7.613)	
Cost of medicines				
Free	30 (40.00%)	13 (41.94%)	1.00	0.831
Partial payment	31 (41.33%)	10 (32.26%)	0.705 (0.229, 2.177)	
Full payment	14 (18.67%)	8 (25.81%)	0.837 (0.238, 2.941)	
Co-morbid conditions				
No	25 (33.33%)	6 (19.35%)	1.00	0.029
Yes	50 (66.67%)	25 (80.65%)	4.226 (1.157, 15.437)	
Side effects				
No	66 (88.00%)	29 (93.55%)	1.00	0.674
Yes	9 (12.00%)	2 (6.45%)	0.689 (0.121, 3.918)	

200 patients) at a tertiary care centre from Karachi.<sup>2</sup> Amongst 89 hypertensive patients from Abbottabad, 46 (51.7%) were non-compliant, based on self-reporting of doses missed during the preceding 3 months.<sup>3</sup> Similarly, using Drug Attitude Inventory, Saleem *et al.* demonstrated 64.7% poor adherence in patients from Quetta.<sup>4</sup> The variable rates can be explained by different instruments used to screen poor compliance. Patients' level of education and the degree of understanding of disease could also be contributory factors.

Remarkably, this study identified co-morbidity as the only predictor of poor compliance to treatment. Conflicting results have been described in the past, with Hashmi *et al.* showing lack of association between co-morbidity and level of compliance.<sup>5</sup> On the other hand, an association similar to that seen in this study was reported in a study done in Ethiopia.<sup>6</sup> Depression co-existing with an increasing number of physical illnesses, as well as greater number of complications could be responsible for a negative attitude towards the use of medicines in patients with co-morbid conditions. None of the other variables reliably predicted poor compliance to treatment. Conflicting results have been quoted previously in this regard as well. However, this study has managed to highlight the impact of compliance on systolic and diastolic blood pressures. It has already been shown previously that blood pressure is better controlled in patients with better adherence to treatment, consistent with the findings of this study. This fact can be used to motivate patients to enhance adherence to pharmacological treatment.

In conclusion, a fair proportion of hypertensive patients have poor compliance to pharmacological treatment. This necessitates screening the patients periodically for poor compliance to treatment, especially more so in those with co-morbid conditions. Such an endeavor would help achieve a better control of blood pressure and thus reduce complications.

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