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Original Research Article

## Medication adherence and its determinants amongst anti-hypertensive patients in a tertiary care hospital in Navi Mumbai

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### ABSTRACT

**Background:** Anti-hypertensive drugs can effectively control hypertension, subject to good adherence. Uncontrolled hypertension can lead to numerous complications, some even potentially fatal, such as myocardial infarction, atherosclerosis, thromboembolism, shock and stroke.

**Methods:** A cross-sectional prospective study was conducted with the help of a pre-validated questionnaire during the course of 6 months in the medicine outpatient department and the inpatient department (wards) at a tertiary care hospital, Navi Mumbai in 200 hypertensive patients to calculate the correlation of the sociodemographic factors with adherence by the chi-squared test.

**Results:** The overall percentage of adherence to antihypertensive medication was 34.8%. It was the highest (72.1%) in the younger age group, i.e., below 50 years. It was observed that as the age increases, the adherence to treatment decreases. Adherence rates were significantly higher among females and those individuals who had never attended school. Among the employed, 70.3% were adherent to their treatment and among the unemployed, 64.4% were adherent. The percentage of adherence was lower in alcohol consumers (9.5%) as compared to nonusers (76% and 32%, respectively).

**Conclusions:** The clinician advising anti-hypertensive therapy should provide thorough counselling and stress on the issues created due to poor medication adherence as hypertension can be associated with severe outcomes. Treatments should be given in accordance with each patient's lifestyles in mind such that they may continue taking their medications till the completion of their therapy.

**Keywords:** Anti-hypertensive drugs, Adherence, Sociodemographic factors

### INTRODUCTION

According to the 8<sup>th</sup> revision of the Joint National Committee (JNC) guidelines, hypertension can be defined as a condition wherein the arterial blood pressure values of a patient are consistently raised above 140 mm of mercury (systolic) and 90 mm of mercury (diastolic).<sup>1</sup> It is the most dangerous non-communicable disease

known to mankind, potentially causing heart attacks and strokes which are among the most common causes of death in the world today. As many as 400–500,000 premature deaths in India could be prevented by better hypertension control.<sup>2</sup> Anti-hypertensive drugs can effectively control hypertension, subject to good adherence. Uncontrolled hypertension can lead to numerous complications, some even potentially fatal,

such as myocardial infarction, atherosclerosis, thromboembolism, shock and stroke.

Adherence is defined by the World Health Organization as “the degree to which the person’s behavior corresponds with the agreed recommendations from a health care provider.”<sup>3</sup> It takes into account the lifestyle, needs and preferences of a patient with regards to ongoing medical treatment. A drug given to a patient for a pre-existing pathology can only prove effective as a means of treatment when it is administered with regularity and appropriate frequency. Inconsistencies in consuming tablets or pills leads to non-adherence of the drug. Subsequently, unproductive management of the disorder and a worsening prognosis can result. Hence, studying the adherence of hypertensive patients towards anti-hypertensive drugs can help develop the treatment and quality of life for these patients in the future.

The importance of adherence is further underlined upon observing the fact that hypertension a disorder which can be well controlled simply with regular anti-hypertensive medications. Certain personally variable factors such as age, sex, employment, alcoholism and so on have been postulated to contribute to non-adherence to medical treatment. This study aims to determine the correlation between these sociodemographic factors and medication adherence for hypertensive patients in our locality, Navi Mumbai.

## METHODS

After taking approval from the Institutional Ethics Committee, a cross-sectional prospective study was conducted during the course of 6 months (August 2018 - January 2019) in the medicine outpatient department and the in-patient department (wards) at DY Patil Hospital and Research Center, Navi Mumbai. The sample size was calculated as in accordance with the required proportion of a confidence level of 95%, a margin of error was 5% and a proportion of compliance was 0.73 used in a previous study, 200 was the sample size calculated for data collection.<sup>4</sup>

The inclusion Criteria were 200 clinically diagnosed hypertensive (as per the guidelines put forth by the 8<sup>th</sup> revision of the JNC in 2014) patients, diagnosed since at least one year, with or without any coexisting pathologies and between the ages of 35-85 years were asked for their informed written consent to participate in this quantitative study.<sup>1</sup> Patients with conditions like dementia, pregnant state or any incapacitating/fatal prognosis were excluded from the study.

### Statistical analysis

These patients answered a questionnaire which was tested and used in a similar previous study by Shah et al 2018, from which data was collected.<sup>5</sup> In this Likert- 5 questionnaire, numerical values were allotted for differing grades of adherence for each patient. The

various socio-demographic factors implicated in the etiology of hypertension were asked for each patient. Through these values, the incidence rate of hypertension was determined. In this study, the relationship between various socio-demographic factors and hypertension was correlated via the Pearson’s correlation co-efficient ‘p’. A value of  $p < 0.05$  was considered significant. Using these values, a chi-squared test was conducted for each factor affecting hypertension to establish the relationship between the two. The duration of study was 6 months.

Each patient’s adherence to their treatment was observed by the healthy changes made in their lifestyles and by adhering to their individual medication schedules. Non-adherence to antihypertensive therapy is defined as skipping even one prescribed dose daily for  $>3$  days in a week, lifestyle habits such as smoking, consumption of alcohol  $>2$  standard drinks for men and 1 standard drink for women, table salt of  $>1$  teaspoon (2400 mg) per day over and above normal use and meat consumption frequently ( $\geq 3$  days in the week).

The data collected was analyzed using percentages and proportions. Chi-square test was applied, wherein  $p \leq 0.05$  was considered statistically significant.

## RESULTS

Out of the total study population of 200 individuals interviewed, 109 were females (54.5%) and 91 were males (45.5%). The mean for age of all the participants was calculated to be  $62.2 \pm 14.6$  years (with the range of age being 18 to 65 years). The percentage of adherence to antihypertensive medication calculated was 34.8%.

The proportion of adherence in the younger age group, i.e., below 50 years was the highest (72.1%). It was observed that as the age increases, the adherence to treatment decreases. Adherence rates were significantly higher among females and those individuals who had never attended school. Among the employed, 70.3% of all the individuals were adherent to their treatment, and among the unemployed, 64.4% were adherent. The percentage of adherence was lower among smokers (2.5%) but was not found to be statistically significant. The percentage of adherence was lower in alcohol consumers (9.5%) as compared to nonusers (76% and 32%, respectively) (Table 1).

The questionnaire also had reasons for non-adherence. The main reasons reported by participants for frequently skipping medication were, 44% forgetting to take medication, while 31.1% discontinued the medication when feeling well, and 11.6% skipped the medication due to the expenses incurred on it.

About 76.6% of the participants engaged in physical exercise daily or frequently. 58% of the participants frequently had table salt. The current study shows that 12% of the total participants were smokers and 15.5% were consuming alcohol.

**Table 1: Association between sociodemographic factors and adherence.**

Variables	Adherent	Non-adherent	Total	Significance
	N (%)	N (%)		
<b>Age (yrs)</b>				
35-45	27 (13.5)	8 (4)	35	NS
45-55	29 (14.5)	21 (10.5)	50	
>55	13 (6.5)	102 (51)	115	
<b>Sex</b>				
Male	54 (27)	37 (18.5)	91	S
Female	76 (38)	33 (16.5)	109	
<b>Education</b>				
Illiterate	87 (43.5)	25 (12.5)	104	NS
Primary school	16 (8)	9 (4.5)	25	
Secondary and higher	59 (29.5)	12 (6)	71	
<b>Marital status</b>				
Married	93 (46.5)	78 (39)	171	S
Not married	17 (8.5)	12 (6)	29	
<b>Employment status</b>				
Employed	106 (53)	60 (30)	166	S
Unemployed	19 (9.5)	15 (7.5)	34	
<b>Smoking</b>				
Yes	5 (2.5)	21 (10.5)	24	NS
No	152 (76)	24 (12)	176	
<b>Alcohol intake</b>				
Yes	19 (9.5)	12 (6)	31	S
No	64 (32)	105 (52.5)	169	

NS: Non significance; S: Significance.

## DISCUSSION

In this study, the proportion of individuals who were non-adherent to antihypertensive treatment was 65.5%. In a similar study done in Mangalore and Pakistan, it was 45.8% and 51.7%, respectively.<sup>6,7</sup> Our study showed a higher rate of non-adherence as compared to other studies. This may be due to a difference in the sociodemographic profile of the study area.

Females were found to be significantly more compliant than males. A study in Vietnam also showed that adherence was low among males.<sup>8</sup> This may be due to the side effects of antihypertensive medication, (mainly thiazide diuretics and beta-blockers except nebivolol) such as impotence, affecting particularly males, as shown in meta-analysis.<sup>9</sup>

Decreased proportion of adherence with antihypertensive medication among smokers and those who consumed alcohol was consistent with the findings of a study conducted in Mangalore.<sup>6</sup> The proportion of treatment compliance (72.1%) was better in the younger age group, i.e., below 50 years. It was observed that as age increases, compliance to treatment decreases. This is similar to a study conducted in Tanzania.<sup>10</sup> Younger individuals are usually employed, and thus, they can afford to buy their medication regularly. In this study, forgetfulness was

found to be a predominant reason for skipping medication. Elderly participants are likely to forget their dose as compared to younger participants.

Adherence was significantly more among those who never went to school, i.e., 82.7% than those who received school education (64.6%). This is consistent with a study done on factors affecting compliance in Tanzania and England who found that patients without formal education had better compliance to medication.<sup>10,11</sup> This may be because patients with lower educational level might have more trust in the physicians' advice.

The clinician advising anti-hypertensive treatment should place firm emphasis on the issues associated with poor adherence to the prescribed medication as hypertension can be associated with severe outcomes. It has been associated with the inability to achieve BP control and a significant increase in the risk for all-cause mortality and hospitalization due to cardiovascular events.<sup>12</sup> Therefore, depending on each patient's case, clinicians should work closely with patients and select the appropriate regimen and time of administration in order to improve adherence.

The limitation of this study was that it involved a subjective method, based on the patient's answers, to assess compliance. Further studies can be done using an objective assessment such as using blister packs that electronically record the opening of compartments. Little

attention has been paid to patients' perceived understanding of their illness and medication. Insight into their perception rather than the expectations and perception of the healthcare professionals may have relevance for understanding noncompliance to medication in a better manner.<sup>5</sup>

## CONCLUSION

On processing the collected data, the adherence to antihypertensive medication was found to be poor, amounting to 34.8% of the total study population. The results also provided an insight into non-adherence. Forgetfulness, the presence of addictions (alcohol and smoking) and a subjective feeling of well-being before the completion of medical therapy were some of the most common causes given for non-adherence to antihypertensive medication. Appropriate lifestyle modifications should be encouraged as they have been associated with better medication adherence which aids the ability to achieve BP control and can help prevent the significant risk of complications due to hypertension.

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