

## An Observational Assessment of the Adherence to Medication in Patients Suffering from Hypertension

Asha Alka<sup>1</sup>, Piyush Anand<sup>2</sup>, Jeetendra Kumar<sup>3</sup>

<sup>1</sup>Tutor, Department of Pharmacology, JLNCH, Bhagalpur, Bihar, India

<sup>2</sup>Tutor, Department of Pharmacology, JLNCH, Bhagalpur, Bihar, India

<sup>3</sup>Associate Professor and HOD, Department of Pharmacology, JLNCH Bhagalpur, Bihar, India

Received: 18-01-2022 / Revised: 21-02-2022 / Accepted: 24-03-2022

Corresponding author: Dr. Piyush Anand

Conflict of interest: Nil

### Abstract

**Aim:** To assess the adherence to medication in patients suffering from hypertension.

**Methodology:** This observational, cross-sectional study was conducted in the Department of Pharmacology, JLNCH, Bhagalpur, Bihar, India for a period of 12 months. All patients suffering from hypertension and on medication were recruited in the study. The patients were recruited after they gave written informed consent. Patients between the ages of 18 to 60 years, with a known history of hypertension (Blood Pressure > 140/100 mmHg) and registered for treatment of hypertension at any hospital for 12 months were included in the study. Based on the number of medications used by patients, they were subdivided into two groups, Group 1 had patients who were on single medication for hypertension whether it was single compound or two compounds in single medication, whereas Group 2 had patients who were taking two or more medications in combination or single compound. To increase the strength and consistency of our results, we included an adherence assessment through the eight item Morisky Medication Adherence Scale (MMAS-8) [14].

**Results:** A total of 100 patients suffering from hypertension visiting the OPD in a period of 12 months were enrollment in the study. The mean age of patients was 50.56±13.34 years, the mean number of medications used was 1.57±0.65 per person and 68% of patients were taking combination of drugs for hypertension. The mean MMAS-8 Score was 4.38±1.24. As compared to participants in Group 1 who were taking a single medication, the participants in Group 2 were on 2.57±0.73 medication per person for treatment of hypertension. The number of participants in Group 1 who were on single compound in one medication was 21 which was statistically ( $p < 0.05$ ) higher than participants in Group 2 ( $n=10$ ). The mean duration of illness was significantly ( $p < 0.05$ ) less in Group 1 as compared to Group 2 (3.94±2.85 years vs. 5.05±2.73 years), the MMAS-8 scores were significantly ( $p < 0.05$ ) higher in Group 1 (4.83±1.74 vs. 4.02±0.93). Patients in Group 1 were more adherent to treatment as compared to Group 2.

**Conclusion:** This study concludes the prevalence of adherence to HT management was low in study population with hypertension. Therefore, there is an urge to continually monitor patients' adherence to antihypertensive medication using a standardized scale. Patients with comorbidities and on multiple medications were at higher risk of non-adherence.

**Keywords:** Hypertension, adherence, medication.

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

## Introduction

Increasing burden of Non-communicable diseases (NCDs) and their risk factors are a cause of concern and one of the most dreaded situations being faced now by India and other nations are the increasing prevalence of Hypertension (HT). HT is one of the most important treatable causes of mortality and morbidity. The CURES cohort suggested that every fifth person in India is hypertensive [1]. Hypertension is a major risk factor for heart failure, myocardial infarction, cerebrovascular disease, and renal failure [2].

The World Health Organization (WHO) has estimated that about 62% of cerebrovascular disease and 49% of ischemic heart disease burden worldwide are attributable to suboptimal blood pressure levels. High blood pressure is estimated to cause 7.1 million deaths annually, accounting for 13% of all deaths globally [3]. Uncontrolled HT has been attributed to patients' failure to follow properly a prescribed drug regimen in approximately half the cases [4, 5]. It is usual to consider patients to be sufficiently compliant with their treatment when they take at least 80% of their prescribed anti-hypertensive drugs [6, 7].

There are several factors that affect blood pressure control. Patients' adherence to treatment is one of the major factors in controlling blood pressure and preventing hypertension complications. The World Health Organization (WHO) defines adherence to long-term therapy as "the extent to which a person's behavior-taking medication, following a diet, and/or executing lifestyle changes-corresponds with agreed recommendations from a healthcare provider" [8]. Patients with a high level of medication adherence were found to have better blood pressure control [9]. Still, adherence to hypertension treatment is challenging, due to the asymptomatic nature of the disease [10].

Medications not being taken as prescribed may be intentional or unintentional as some make rational choices over their medication or as the consequence of forgetfulness, carelessness or ambivalence on the part of the patient rather than as a definite decision [11]. A thorough literature search has shown that data on adherence to medication in patients suffering from hypertension in India is lacking hence we designed this study to assess the adherence to medication in patients suffering from hypertension.

## Materials and Methods

This observational, cross-sectional study was conducted in the Department of Pharmacology, JLNMCH, Bhagalpur, Bihar, India for a period of 12 months.

## Methodology

All patients suffering from hypertension and on medication were recruited in the study. The patients were recruited after they gave written informed consent. Patients between the ages of 18 to 60 years, with a known history of hypertension (Blood Pressure > 140/100 mmHg) and registered for treatment of hypertension at any hospital for 12 months were included in the study. Patients with chronic renal disease or end stage renal disease, history of heart or respiratory failure, recent myocardial infarction (MI), shock, liver disease, chronic alcohol use, pregnant or lactating females were excluded from study.

The participants suffering from hypertension and on treatment for the past 12 month were recruited in the study after they gave a written informed consent. A detailed history was taken, and the participants underwent a thorough clinical examination, they were also given counselling for life style modifications.

To increase the strength and consistency of our results, we included an adherence assessment through the eight item Morisky

Medication Adherence Scale (MMAS-8) [14]. The MMAS-8 asks patients to respond with “yes” or “no” to a set of 7 questions and to one 5-point Likert scale question. The score for full adherence is 8, with lower scores indicating a poorer level of adherence with a lower boundary of zero. In this study patients were described as non-adherent if they had an MMAS-8 score < 6 and as adherent if their score was  $\geq 6$ . The patients were given questionnaire of Morisky Medication Adherence Scale-8 (MMAS-8) and WHOQOL Bref; they were given time to fill up the questionnaire in a separate room without any interference from the treating physician.

Based on the number of medications used by patients, they were subdivided into two groups, Group 1 had patients who were on single medication for hypertension

whether it was single compound or two compounds in single medication, whereas Group 2 had patients who were taking two or more medications in combination or single compound. 51 patients were included in Group 1 and 49 patients were included in Group 2. All the patients gave informed consent and were included in the analysis of result.

### Results:

A total of 100 patients suffering from hypertension visiting the OPD in a period of 12 months were enrollment in the study. The mean age of patients was  $50.56 \pm 13.34$  years, the mean number of medications used was  $1.57 \pm 0.65$  per person and 68% of patients were taking combination of drugs for hypertension. The mean MMAS-8 Score was  $4.38 \pm 1.24$ .

**Table 1: Baseline characteristic of participants**

Characteristic	(n=100)
Age (years) (Mean $\pm$ SD)	50.56 $\pm$ 13.34
Sex(M:F)	48:52
Duration of illness (years) (Mean $\pm$ SD)	4.23 $\pm$ 2.98
Number of Medications used (Mean $\pm$ SD)	1.57 $\pm$ 0.65
% Medications as Drug Combination	76 % (n=68)
Morisky Medication Adherence Scale – 8 (MMAS-8) Score (Mean $\pm$ SD)	4.38 $\pm$ 1.24

As compared to participants in Group 1 who were taking a single medication, the participants in Group 2 were on  $2.57 \pm 0.73$  medication per person for treatment of hypertension. The number of participants in Group 1 who were on single compound in one medication was 21 which was statistically ( $p < 0.05$ ) higher than participants in Group 2 (n=10). The mean

duration of illness was significantly ( $p < 0.05$ ) less in Group 1 as compare to Group 2 ( $3.94 \pm 2.85$  years vs.  $5.05 \pm 2.73$  years), the MMAS-8 scores were significantly ( $p < 0.05$ ) higher in Group 1 ( $4.83 \pm 1.74$  vs.  $4.02 \pm 0.93$ ). Patients in Group 1 were more adherent to treatment as compared to Group 2.

**Table 2: Baseline characteristic of both groups**

Characteristic	Group 1 (n=51)	Group 2 (n=49)
Age (years) (Mean $\pm$ SD)	49.33 $\pm$ 9.24	51.17 $\pm$ 11.64
Sex(M:F)	26:24	28:21
Duration of illness (years) (Mean $\pm$ SD)	3.94 $\pm$ 2.85	5.05 $\pm$ 2.73
Number of Medications used (Mean $\pm$ SD)	1	2.57 $\pm$ 0.73

Medications as Drug Combination (single drug: drug combination)	21:30	10:39
Morisky Medication Adherence Scale – 8 (MMAS-8) Score (Mean±SD)	4.83±1.74	4.02±0.93

**Table 3: Correlation coefficients for MMAS-8 scores with WHO-QOL Bref Scores among patients in both groups**

Variables	MMAS-8 Scores			
	Group 1 (n=51)		Group 2 (n=49)	
	R	p	R	P
Domain I/ Physical Health	0.30	<0.05	0.10	0.59
Domain II/ Psychological	-0.06	0.50	0.13	0.29
Domain III/ Social Relationship	0.31	<0.05	0.07	0.56
Domain IV/ Enviroirment	0.05	0.61	-0.05	0.70

\*p<0.05 and statistically significant

### Discussion:

This prospective study done to assess the adherence to medication in patients suffering from hypertension, the study showed that patients had a low adherence score and it was significantly lower in patients who were taking two or more medications in combination or single compound. Our study also demonstrated that quality of life was slightly better in patients on single medication and had better adherence correlation as compared to patients on more than two medications.

Several studies investigated the adherence rate among hypertension patients and sociodemographic factors affecting medication adherence including age, gender, comorbidities, patients' knowledge about the disease, the number of medications. A study conducted in Saudi Arabia showed that only 34.7% of male hypertensive patients were found to be adherent to their medication [12]. The study reported a negative association between the presence of comorbidities and the adherence level [12]. A cross-sectional study on medication adherence among patients with hypertension in Malaysia, found an association between adherence and good knowledge of the medications and disease [13]. The study also found that

the increase in the number of drugs patients taking has a negative effect on medication adherence [13]. Other studies had similar findings regarding the association between the number of medications and adherence [14, 15].

In a cross-sectional study conducted in Iran, older patients reported high adherence to antihypertensive medication and better knowledge of their disease than younger patients [15]. However, number of studies reported no significant associations between age and medication adherence [16]. Female patients were more likely to adhere to their medication, compared to males [17]. Another study on the prevalence and predictors of poor antihypertensive reported that male patients were more adherent than female patients [18]. Some studies reported no relationship between gender and adherence [915, 16].

A study done to assess the adherence level to antihypertensive treatment and to identify its associated factors in a sample of hypertensive patients in Lebanon and Jordan observed that 55.9% of the patients were adherent to their antihypertensive medication [19]. The results of our study are quite similar to this study as in our

study patients who were on single medication and lesser duration of illness had better adherence. The quality of life of participants in our study was also slightly better in patients on single medication. One more study to assess the treatment adherence among adults with hypertension demonstrated that patients with longer duration of illness were not medicated and majority of patients were non adherent to antihypertensive therapy. The results of this study are somewhat similar to our study as our study showed that patients with a longer duration of illness and on more than two drugs were non adherent as compared to the other group [20, 21].

### Conclusion:

This study concludes the prevalence of adherence to HT management was low in study population with hypertension. Therefore, there is an urge to continually monitor patients' adherence to antihypertensive medication using a standardized scale. Patients with comorbidities and on multiple medications were at higher risk of non-adherence. There is a need to encourage patients on multiple medications to use adherence aids such as weekly pill organizers and medication alarm devices.

### References:

1. Mohan V, Deepa M, Farooq S, Datta M, Deepa R. Prevalence, awareness and control of hypertension in Chennai — The Chennai Urban Rural Epidemiology Study (CURES-52) J Assoc Physicians India. 2007; 55:326–32.
2. Chobanian AV, Bakris GL, Black HR, et al. Prevention, detection, evaluation, and treatment of high blood pressure the seventh report of the joint National Committee on complete report. Natl High Blood Press Educ Progr. 2003; 42(6):1206.
3. Reducing risks, promoting healthy life. Geneva, Switzerland: World Health Organization; 2002. [Last accessed on 2022 Feb 27]. World Health Report 2002. Available from: [http://www.who.int/whr/2002/en/whr02\\_en.pdf](http://www.who.int/whr/2002/en/whr02_en.pdf).
4. Col N, Fanale JE, Kronholm P. The role of medication noncompliance and adverse drug reactions in hospitalizations of the elderly. Arch Intern Med. 1990; 150:841–5.
5. NHLBI Working Group. Management of patient compliance in the treatment of hypertension: Report. Hypertension. 1982; 4:415–23.
6. Krall R. Patient compliance in medical practice and clinical trials. New York: Raven Press; 1991. Interactions of compliance and patient safety; p. 1925.
7. Sackett DL, Haynes RB, Gibson ES, Taylor DW, Roberts RS, Johnson AL. Patient compliance with antihypertensive regimens. Patient Couns Health Educ. 1978; 1:18–21.
8. De Geest S, Sabaté E. Adherence to long-term therapies: Evidence for action. Eur J Cardiovasc Nurs. 2003; 2:323.
9. Bramley TJ, Gerbino PP, Nightengale BS, Frech-Tamas F. Relationship of blood pressure control to adherence with antihypertensive monotherapy in 13 managed care organizations. J Manag Care Pharm. 2006;12(3):239–245.
10. Saeed AA, Al-Hamdan NA, Bahnassy AA, Abdalla AM, MAF A, Abuzaid LZ. Prevalence, awareness, treatment, and control of hypertension among Saudi adult population: A national survey. Int J Hypertens. 2011, 2011:174135.
11. Ross S, Walker A, MacLeod MJ. Patient compliance in hypertension: Role of illness perception and treatment beliefs. Journal of Human Hypertension 2004; 18:607-13.
12. Elbur AI. Level of adherence to lifestyle changes and medications among male hypertensive patients in

- two hospitals in taif; kingdom of Saudi Arabia. *Int J Pharm Pharm Sci.* 2015;7 (4):168–172.
13. Ramli A, Ahmad NS, Paraidathathu T. Medication adherence among hypertensive patients of primary health clinics in Malaysia. *Patient Prefer Adherence.* 2012; 6:613–622.
  14. Al-Sowielem LS, Elzubier AG. Compliance and knowledge of hypertensive patients attending PHC centres in Al-Khobar, Saudi Arabia. *East Mediterr Heal J.* 1998;4(2):301–307.
  15. Hadi N, Rostami-Gooran N. Determinant factors of medication compliance in hypertensive patients of Shiraz, Iran. *Arch Iran Med.* 2004;7(4):292–296.
  16. Goussous LS, Halasah NA, Halasa M. Non - Compliance to Antihypertensive Treatment among Patients Attending Prince Zaid Military Hospital. *World Fam Med Journal/Middle East J Fam Med.* 2015;13(1):15–19.
  17. Schoberberger R, Janda M, Pescosta W, Sonneck G. The COMpliancepraxiS survey (COMPASS): a multidimensional instrument to monitor compliance for patients on antihypertensive medication. *J Hum Hypertens.* 2002;16(11):779–787.
  18. Hyre AD, Krousel-Wood MA, Muntner P, Kawasaki L, KB DS. Prevalence and Predictors of Poor Antihypertensive Medication Adherence in an Urban Health Clinic Setting. *J ClinHypertens.* 2007;9(3):179–186.
  19. Alhadad IA, Hamoui O, Hammoudeh A, Mallat S. Treatment adherence and quality of life in patients on antihypertensive medication in a Middle East population: Adherence. *Vascular Health and Risk Management* 2016; 12:407-13.
  20. Amaral O, Chaves C, Duarte J, Coutinho E, Nelas P, Preto O. Treatment adherence in hypertensive patients – A cross sectional study. *Procedia-Social and Behavioral Sciences* 2015; 171:1288-95.
  21. Makhubele, H. D., & Bhuiyan, M. M. Primary Non-Hodgkin's Lymphoma of the bilateral Breast and review the literature. *Journal of Medical Research and Health Sciences,* 2020:3(4), 926–930.