

## A Research to Determine Whether or Not Individuals with Hypertension are Adhering to their Drug Regimen

Khursheed Anwar<sup>1</sup>, Kapil Kumar Singh<sup>2</sup>, Jeetendra Kumar<sup>3</sup>

<sup>1</sup>Assistant Professor, Department of Pharmacology, JLNMCH, Bhagalpur, Bihar, India

<sup>2</sup>Assistant Professor, Department of Pharmacology, JLNMCH, Bhagalpur, Bihar, India

<sup>3</sup>Associate Professor & HOD, Department of Pharmacology, JLNMCH, Bhagalpur, Bihar, India

---

Received: 09-07-2021 / Revised: 11-08-2021 / Accepted: 24-09-2021

Corresponding author: Dr. Kapil Kumar Singh

Conflict of interest: Nil

---

### Abstract

**Aim:** Aim of the present study to assess the adherence to medication in patients suffering from hypertension. **Materials and Method:** This observational, cross-sectional study was conducted participants suffering from hypertension for the past 1 year and on treatment conducted in Department of Pharmacology, J.L.N.M.C.H, Bhagalpur. The study targeted outpatients aged  $\geq 18$  years who were diagnosed with hypertension. Participants were recruited using a systemic sampling technique. A detailed history, thorough medical examination, and counselling for lifestyle modifications was done on all participants enrolled. The patients were given questionnaire of Morisky Medication Adherence Scale-8 (MMAS- 8) and WHO-QOL Bref to be filled up the questionnaire in a separate room. **Results:** A total of 152 patients participated in the study with mean number of medication used being  $1.68 \pm 0.79$ /person, 74% of patients were taking combination of drugs and mean MMAS-8 Score was  $4.30 \pm 1.07$ . The participants were subdivided into two groups, Group 1 (on single medication) and Group 2 (on two or more medications). Group 1 had significantly higher MMAS-8 scores and better quality of life. **Conclusion:** Patient's on single medication had significantly better adherence, slightly better quality of life and better adherence correlation as compared to patients on more than two medications.

**Keywords:** Hypertension, Quality of Life, 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

The global burden of hypertension, defined as blood pressure (BP, mm Hg)  $\geq 140$  systolic or  $\geq 90$  diastolic or antihypertensive treatment, was projected to rise from 918 million adults in calendar year 2000 to 1.56 billion in 2025 [1]. The projected increase in the burden of hypertension reflected an expected rise in both prevalent hypertension from 26.4% to 29.2% and the

worldwide population. By 2010, these projections appeared conservative as the worldwide prevalence of hypertension was estimated at 31.1%, affecting 1.39 billion people [2].

Assuming clinically valid BP values, 2 major factors contribute to hypertension control in treated patients; namely, prescription of an adequate number and

dose of prescribed BP medications and adherence with therapy. This review focuses on patient adherence as a critical variable in BP control. Insightful statements with timeless truth include “Drugs don’t work in patients who don’t take them” [3] and “the full benefits of medications cannot be realized at currently achievable levels of adherence.” [4]

The prevalence of hypertension varies from 12-17% among rural adults to 20-40% among urban adults, and the number of people with hypertension nearly equal numbers of men and women is projected to increase from 118 million in 2000 to 214 million in 2025 [5,6]. According to WHO Health statistics 2012, 23.1% men and 22.6% women have hypertension in population in the age group of 25 or more than 25 years of age. It was considered responsible for about 12.8 percent of the total of all global deaths causing approximately 51% of death from strokes and 45% from coronary artery disease in 2004 [7].

A study done in United Kingdom to describe hypertensive patients’ beliefs about their illness and medication showed that those patients who believed in the necessity of medication were more compliant, number of other important predictive factors were age, emotional response to illness and belief in personal ability to control illness. So, information about health beliefs was important to achieve concordance and might be a target for intervention to improve compliance [8]. 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.

#### **Methodology:**

This observational, cross-sectional study was conducted in the Department of Pharmacology, J.L.N.M.C.H, Bhagalpur for 1 year. All patients suffering from hypertension and on medication were recruited in the study. The study was approved by the Institutional Ethics

Committee and 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 particular centre 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. A detailed history was taken, and the participants underwent a thorough clinical examination, they were also given counselling for lifestyle modifications. The patients were given questionnaire of Morisky Medication Adherence Scale-8 (MMAS-8) and WHO- QOL Bref; they were given time to fill up the questionnaire in a separate room without any interference from the treating physician.

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  $\geq 6$ .

#### **Results:**

A total of 350 patients suffering from hypertension visiting the OPD in a period of 15 months were screened for enrollment in the study, 35 patients were not enrolled in the study as they did not fulfill the eligibility criteria for enrollment in the study. Around 13 patients were not included because they did not give the informed consent. A total of 302 patients participated in the study, the baseline demographics of the participants are shown in Table 1. The mean age of patients was

48.67±12.42 years, the mean number of medications used was 1.82±0.98 per person and 74% of patients were taking

combination of drugs for hypertension. The mean MMAS-8 Score was 4.30±1.07

**Table 1: Baseline characteristic of participants**

Characteristic	(n=302)
Age (years) (Mean±SD)	48.67±12.42
Sex(M:F)	160:142
Duration of illness (years) (Mean±SD)	5.02±2.87
Number of Medications used (Mean±SD)	1.82±0.98
% Medications as Drug Combination	74.5 % (n=225)
Morisky Medication Adherence Scale – 8 (MMAS-8) Score (Mean±SD)	4.30±1.07

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. 155 patients were included in Group 1 and 147 patients were included in Group 2. All the patients gave informed consent.

The participants in Group 2 were on 2.56±0.82 medication per person for treatment of hypertension. The number of participants in Group 1 who were on single compound in one medication was 64 which was statistically higher than participants in Group 2 (n=12). The mean duration of illness was significantly less in Group 1 as compared to Group 2 (3.84±2.57 years vs. 5.68±3.01 years), the MMAS-8 scores were significantly higher in Group 1 (5.11±1.53 vs. 3.72±0.84) – 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=158)	Group 2 (n=144)
Age (years) (Mean±SD)	52.44±9.70	53.92±10.33
Sex(M:F)	80:78	76:68
Duration of illness (years) (Mean±SD)	3.84±2.57	5.68±3.01
Number of Medications used (Mean±SD)	1	2.64± 0.76
Medications as Drug Combination (single drug: drug combination)	58:100	34:110
Morisky Medication Adherence Scale – 8 (MMAS-8) Score (Mean±SD)	5.11±1.53	3.72±0.84

### Discussion:

The global epidemic of hypertension is largely uncontrolled, and hypertension remains the leading cause of non-communicable disease deaths worldwide. Suboptimal adherence, which includes failure to initiate pharmacotherapy, to take medications as often as prescribed, and to persist on therapy long-term, is a well-recognized factor contributing to the poor

control of blood pressure in hypertension. Several categories of factors including demographic, socioeconomic, concomitant medical-behavioral conditions, therapy-related, healthcare team and system-related factors, and patient factors are associated with nonadherence. Understanding the categories of factors contributing to nonadherence is useful in managing nonadherence. In patients at high risk for major adverse cardiovascular

outcomes, electronic and biochemical monitoring are useful for detecting nonadherence and for improving adherence.

The risk of cardiovascular disease can be reduced by appropriate treatment of hypertensive patients either through lifestyle interventions alone or in combination with medication [11,12] Lifestyle intervention in mild cases should be the initial approach to hypertension management which includes dietary interventions, weight reduction, tobacco cessation, and physical activity [13]. Study has shown that reduction of 3.8 mmHg and 1.5mmHg in systolic and diastolic pressure, respectively, decreased the development of left ventricular hypertrophy by 37% and a decrease of cardiovascular event by 50% [9,14]. The primary and secondary prevention of cardiovascular disease requires long term adherence to medication for control of hypertension [9,15]. Many advances in treatment have been made, over the last few years; new antihypertensive drugs with lower incidence of adverse events have been developed [15,16].

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. Criteria's associated with better adherence were older age, whereas, being divorced or widowed, had a poorer quality of life. 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 [9].

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 [10].

### Conclusion:

It was observed 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.

The healthcare team can take several steps to improve patient adherence through shared decision making on management, ensuring patients understand the severity and consequences of their disease and benefits of treatment and control, facilitating BP self-monitoring with relay and advice, prescription of low-cost, effective medications, especially as single pill combinations, and frequent follow-up of patients with uncontrolled hypertension.

### References:

1. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. *Lancet*. 2005; 365:217–223.
2. Mills KT, Bundy JD, Kelly TN, Reed JE, Kearney PM, Reynolds K, Chen J, He J. Global disparities of hypertension prevalence and control: a systematic analysis of population-based studies from 90 countries. *Circulation*. 2016; 134:441–450
3. Lindenfeld J, Jessup M. 'Drugs don't work in patients who don't take them' (C. Everett Koop, MD, US Surgeon General, 1985). *Eur J Heart Fail*. 2017; 19:1412–1413.
4. McDonald HP, Garg AX, Haynes RB. Interventions to enhance patient adherence to medication prescriptions:

- scientific review. JAMA. 2002; 288:2868–2879.
5. Reddy KS. Regional case studies–India. Nestle Nutr Workshop Ser Pediatr Program. 2009; 63:15-24 discussion 41-16, 259-68.
  6. Hypertension in India. (Accessed on 30<sup>th</sup> August, 2017). Available on url. <http://www.cadiresearch.org/topic/hypertension/hypertension-india>
  7. World Health Organization. Prevention of cardiovascular disease. Pocket guidelines for assessment and management of cardiovascular risk. WHO Press 2007? Available at url: [ish-world.com/downloads/activities/Pocket\\_GL\\_ENGLISH\\_A\\_FR\\_D-E\\_rev1.pdf](http://ish-world.com/downloads/activities/Pocket_GL_ENGLISH_A_FR_D-E_rev1.pdf)
  8. 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.
  9. 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.
  10. 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.
  11. World Health Organization. Prevention of cardiovascular disease. Pocket guidelines for assessment and management of cardiovascular risk. WHO Press 2007. Available at url: [ish-world.com/downloads/activities/Pocket\\_GL\\_ENGLISH\\_A\\_FR\\_D-E\\_rev1.pdf](http://ish-world.com/downloads/activities/Pocket_GL_ENGLISH_A_FR_D-E_rev1.pdf)
  12. Meinema JG, van Dijk N, Beune EJAJ, Jaarsma DADC, van Weert HCPM, Haafkens JA. Determinants of adherence to treatment in hypertensive patients of African Descent and role of culturally appropriate education. PLoS ONE 2015;10(8): e0133560.
  13. Gupta R, Gupta S. Strategies for initial management of hypertension. Indian J Med Res 2010; 132:531-42.
  14. Verdecchia P, Staessen JA, Angeli F, de Simone G, Achilli A, Ganau A, et.al. Usual versus tight control of systolic blood pressure in non-diabetic patients with hypertension (Cardio-Sis): An open-label randomized trial. Lancet 2009;374(9689):525-33.
  15. 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.
  16. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, et al. Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. Hypertension 2003;42(6):1206–52.