

Observational Cross Sectional Study to Assess the Adherence Status to the Medication in Patients Suffering from Hypertension, in a Tertiary Care Teaching Hospital of North Bihar

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Conflict of interest: Nil

Abstract

Aim: Adherence to medication in patients suffering from hypertension.

Material and methods: This observational cross-sectional study was carried out in the Department of Pharmacology, Shree Krishna Medical College and Hospital, Muzaffarpur, Bihar, India. 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. 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.

Results: The mean age of patients was 54.16 ± 11.01 years, the mean number of medication used was 1.78 ± 0.89 per person and 75% of patients were taking combination of drugs for hypertension. The mean MMAS-8 Score was 4.40 ± 1.17 . As compared to participants in Group 1 who were taking a single medication, the participants in Group 2 were on 2.51 ± 0.60 medication per person for treatment of hypertension. The number of participants in Group 1 who were on single compound in one medication was 35 which was statistically ($p < 0.05$) higher than participants in Group 2 ($n=15$). The mean duration of illness was significantly ($p < 0.05$) less in Group 1 as compare to Group 2 (4.34 ± 2.44 years vs. 5.42 ± 2.72 years), the MMAS-8 scores were significantly ($p < 0.05$) higher in Group 1 (4.75 ± 1.30 vs. 3.83 ± 0.87) – patients in Group 1 were more adherent to treatment as compared to Group 2. WHO-QOL bref scores are shown in Fig. 1. Group 1 had higher scores in 3 domains that is, physical health (11.86 ± 1.36 vs. 11.82 ± 1.35), and social relationship (12.96 ± 3.98 vs. 12.34 ± 3.96) and environment (11.76 ± 1.32 vs. 11.75 ± 1.36) whereas Group 2 had higher scores in psychological (12.67 ± 2.36 vs. 12.84 ± 2.25) domain, but it was not statistically significant. As the questionnaires were to be filled up by patients only, hence there was a possibility of interpretation bias based on understanding of the patients.

Conclusion: To conclude 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.

Keywords: adherence, medication, hypertension

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Introduction

Hypertension is one of the most common chronic diseases worldwide. Globally as estimated 26% of the world's population (972 million people) having hypertension and the prevalence is expected to increase to 29% by the year 2025. In recent studies from India has shown the prevalence of hypertension to be 25% in urban and 10% in rural population. [1]

Hypertension is a major risk factor for heart failure, myocardial infarction, cerebrovascular disease, and renal failure. [2] Controlling hypertension reduces the risk of cerebrovascular accident (CVA), coronary heart disease, congestive heart failure, and mortality. [3] 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.[3] 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". [3] Patients with a high level of medication adherence were found to have better blood pressure control. [4] Still, adherence to hypertension treatment is challenging, due to the asymptomatic nature of the disease. [5]

Several studies investigated the adherence rate among hypertension patients and sociodemographic factors affecting medication adherence including age, gender, co-morbidities, 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. [6] The study reported a negative association between the presence of co morbidities and the adherence level. [6] 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.[7] The study also found that the increase in the number of drugs patients taking has a negative effect on medication adherence. [7] Other studies had similar findings regarding the association between the number of medications and adherence. [8-10] 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. [9] However, number of studies reported no significant associations between age and medication adherence. [11] Female patients were more likely to adhere to their medication, compared to males. [12] Another study on the prevalence and predictors of poor antihypertensive reported that male patients were more adherent than female patients. [13] Some studies reported no relationship between gender and adherence. [11] Educational level and health literacy were shown to be associated with medication adherence. A cross-sectional study conducted in Iraq showed that adherence decreased in patients with primary and secondary school education, while no significant difference among patients with higher education and undereducated patients. [13] Hence the present study was undertaken with the aim to access the adherence status to medication in patients suffering from hypertension.

Material and methods

This observational cross-sectional study was carried out in the Department of Pharmacology, Shree Krishna Medical College and Hospital, Muzaffarpur, Bihar, India. All patients suffering from hypertension and on medication were recruited in the study. Patients between the ages of 18 to 58 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.

Methodology

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. 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.

Measurement of adherence

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 ≥ 6 .

The WHOQOL – Bref: was monitored at visit. This is a 26-item self-administered generic questionnaire, a short version of

WHOQOL -100 scales. It can be analyzed from perspective of either six domains (physical health, psychological health, level of independence, social relationships, environment, & spiritual) or four domains (physical health, psychological health, social relations, and environment). [15] The QOL index of each domain and their associations with demographic factors were assessed, a higher score indicated a better quality of life. [16-18]

Statistical Analysis

The data was tabulated as mean \pm standard deviation (SD). Results were analyzed using nonparametric tests (Chi-Square Test), parametric tests (two tailed student t-test) and correlation (Pearson correlation coefficients) analysis. A $p < 0.05$ was considered statistically significant.

Results

A total of 220 patients suffering from hypertension visiting the OPD in a period of 12 months were screened for enrollment in the study, 13 patients were not enrolled in the study as they did not fulfill the eligibility criteria for enrollment in the study. Around 7 patients were not included because they did not give the informed consent. A total of 200 patients participated in the study, the baseline demographics of the participants are shown in Table 1.

The mean age of patients was 54.16 ± 11.01 years, the mean number of medications used was 1.78 ± 0.89 per person and 75% of patients were taking combination of drugs for hypertension. The mean MMAS-8 Score was 4.40 ± 1.17 , the mean scores of WHO-QOL Bref scores are shown in Table 1.

Table 1: Baseline characteristic of participants

Characteristic	(n=200)
Age (years) (Mean \pm SD)	54.16 \pm 14.01
Sex(M:F)	110:90
Duration of illness (years) (Mean \pm SD)	4.86 \pm 2.63
Number of Medications used (Mean \pm SD)	1.78 \pm 0.89

% Medications as Drug Combination	75 %
Morisky Medication Adherence Scale – 8 (MMAS-8) Score (Mean±SD)	4.40±1.17
Domain I/ Physical Health (Mean±SD)	11.84±1.35
Domain II/ Psychological (Mean±SD)	12.75±2.30
Domain III/ Social Relationship (Mean±SD)	12.67±3.97
Domain IV/ Enviroiment (Mean±SD)	11.76±1.33

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. 100 patients were included in Group 1 and 100 patients were included in Group 2. All the patients gave informed consent and were included in the analysis of result. The characteristics of the patients in both groups are shown in Table 2. As compared to participants in Group 1 who were taking a single medication, the participants in Group 2 were on 2.51±0.60 medication per person for treatment of hypertension. The number of participants in Group 1 who were on single compound in one medication was 35 which was statistically (p<0.05) higher

than participants in Group 2 (n=15). The mean duration of illness was significantly (p<0.05) less in Group 1 as compared to Group 2 (4.34±2.44 years vs. 5.42±2.72 years), the MMAS-8 scores were significantly (p<0.05) higher in Group 1 (4.75±1.30 vs. 3.83±0.87) – patients in Group 1 were more adherent to treatment as compared to Group 2. WHO-QOL brief scores are shown in table 2. Group 1 had higher scores in 3 domains that is, physical health (11.86±1.36 vs. 11.82±1.35) and social relationship (12.96±3.98 vs. 12.34±3.96) and environment (11.76±1.32 vs. 11.75±1.36) whereas Group 2 had higher scores in psychological (12.67±2.36 vs. 12.84±2.25) domain, but it was not statistically significant. As the questionnaires were to be filled up by patients only, hence there was a possibility of interpretation bias based on understanding of the patients.

Table 2: Baseline characteristic of both groups

Characteristic	Group 1 (n=100)	Group 2 (n=100)	p value
Age (years) (Mean±SD)	53.44±8.70	54.92±11.33	0.31
Sex(M:F)	55:45	53:47	0.69
Duration of illness (years) (Mean±SD)	4.34±2.44	5.42±2.72	<0.05*
Number of Medications used (Mean±SD)	1.1	2.51± 0.60	<0.05*
Medications as Drug Combination (single drug: drug combnation)	35:65	15:85	<0.05*
Morisky Medication Adherence Scale – 8 (MMAS-8) Score (Mean±SD)	4.85±1.30	3.83±0.87	<0.05*
Domain I/ Physical Health (Mean±SD)	11.86±1.36	11.82±1.35	0.75
Domain II/ Psychological (Mean±SD)	12.67±2.36	12.84±2.25	0.52
Domain III/ Social Relationship (Mean±SD)	12.96±3.98	12.34±3.96	0.23
Domain IV/ Enviroiment (Mean±SD)	11.76±1.32	11.75±1.36	0.88
*p<0.05 and statistically significant			

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=100)		Group 2 (n=100)	
	r	p	r	p
Domain I/ Physical Health	0.33	<0.05*	0.07	0.63
Domain II/ Psychological	-0.08	0.57	0.12	0.32
Domain III/ Social Relationship	0.30	<0.05*	0.07	0.60
Domain IV/ Enviroiment	0.06	0.70	-0.06	0.70
*p<0.05 and statistically significant				

Estimates of correlation for MMAS-8 Scores with WHO-QOL Bref Scores along with their significant levels among patients in Group 1 and 2 are presented in Table 3. It has been observed that MMAS-8 Score had significant ($p<0.05$) correlation with physical health, and social relationship in Group 1

Discussion

Several studies have investigated factors affecting medication adherence. Hypertension is an important public health problem leading to increased mortality, morbidity, and disability mainly due to increased cardiovascular disease like cerebral vascular accidents, and myocardial infarction. Various studies have shown that poor compliance to antihypertensive medication significantly increases the short and long term risk of stroke in hypertensive patients. [19] 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.

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. [20]

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.¹⁹

Another study done on hypertensive ethnic minority patients of African descent to identify patient- related determinants of adherence to lifestyle and medication recommendations demonstrated that medication adherence can be supported by paying attention to patients' medication self-efficacy, the concerns they may have about medication use and patients' perceptions on hypertension. The results are somewhat similar to our study except that in our study it was just a onetime

survey and patients was not followed up. [21]

One more study done to measure the adherence to antihypertensive therapy in a representative sample of the hypertensive Pakistani population demonstrated that younger age, poor awareness, and symptomatic treatment adversely affected adherence to antihypertensive medication and mono therapy reduced adherence. The results of our study are different from this study as our study demonstrated that patients on single medication had better adherence as compared to patients taking two or more medication. [22] Another study designed to describe hypertensive patients' beliefs about their illness and medication using the self-regulatory model showed that patients who believed in the necessity of medication were more likely to be compliant. Other important predictive factors were age, emotional response to illness and belief in personal ability to control illness. Our study is dissimilar to this study as our study highlighted the importance of single medication and duration of illness to be a predictor for better adherence. [23]

There are certain limitations in our study, firstly the sample size could have been larger but, the duration of study was less hence we tried to include patients who fulfilled the eligibility criteria. Secondly, a follow up of patient could have been done but this could have prolonged the duration of study. [24]

Conclusion

To conclude 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.

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