Adherence to medication in patients suffering from hypertension: A cross sectional study

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Abstract

Introduction: Hypertension is a global health challenge and responsible for about 12.8 percent of the total of all global deaths due to cardiovascular diseases. The prevention of cardiovascular disease requires long term adherence to antihypertensive medication. Studies have shown that over half of all hypertensive patients do not take any treatment and there is requirement of efforts on all levels to increase the adherence. Data on adherence to medication in patients suffering from hypertension is lacking hence we designed this 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 12 months and on treatment. A detailed history, thorough medical examination, and counselling for life style 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±0.79/person, 74% of patients were taking combination of drugs and mean MMAS-8 Score was 4.30±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: Patients' 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, Adherence, Quality of life, Medication.

Introduction

Hypertension is a global health challenge and major public health problem as its prevalence continues to grow rapidly in both developed and developing countries among both urban as well as rural population.[1-3] 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.[4,5] 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.[6]

The risk of cardiovascular disease can be reduced by appropriate treatment of hypertensive patients either through lifestyle interventions alone or in combination with medication.[6,7] Lifestyle intervention in mild cases should be the initial approach to hypertension management which includes dietary interventions, weight reduction, tobacco cessation, and physical activity.[1] 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%.[3,8] The primary and secondary prevention of cardiovascular disease requires long term adherence to medication for control of hypertension.[3,9] Many advances in treatment have been made, over the last few years; new antihypertensive drugs with lower incidence of adverse events have been developed.[3,9,10]

Studies have shown antihypertensive medications to be effective but poor compliance with antihypertensive medication in everyday practice[9] have shown that over half of all hypertensive's do not take any treatment and more than half of those on treatment have blood pressures over the 140/90 mmHg threshold.[11] The most important cause of uncontrolled blood pressure as described by World Health Organization (WHO) is poor adherence as 50–70% of people do not take their antihypertensive medication as prescribed.[11] Rates of noncompliance may be as high as 50% in chronic conditions with level as different as 20 and 80% in various studies in hypertension. 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.[9]

Adherence as defined by WHO is ''the extent to which a person's behavior–taking medication, following a diet, and/or executing lifestyle changes-corresponds with agreed recommendations from a health care provider''.[11,12] A lot of factors influence

adherence to treatment which include faith in the physician, fear of complications and desire to control blood pressure.[9] Other factors that adherence is dependent on include age, gender, low socioeconomic status, class of drug prescribed, number of pills per day, understanding of disease and any co morbid condition.[11] A patients with hypertension having no symptoms and the fact that they do not feel unwell encourages non compliance are among the other few factors that determine non adherence.[9,11]

A study done in United Kingdom to describe hypertensive patients' beliefs about their illness and medication showed that that 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.[9] Another study done in Portugal to assess the treatment adherence among adults with hypertension showed that most hypertensive patients do not adhere properly to treatment;[13] medication self-efficacy and social support were associated with medication adherence.[7] The perception of illness by creating more understanding of hypertension and concerned risk improves adherence.[7] There is requirement of efforts to be exerted on all levels in order to increase the adherence to antihypertensive treatment through the implementation of educational campaigns.[3]

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 Method

This observational, cross-sectional study was conducted in the Department of Internal Medicine, of a tertiary care teaching hospital in North India for a period of 18 months between April 2013 and October 2014. 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.

Procedure

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

Parameters

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, 17, 18).

Statistical Analysis

The data was tabulated as mean ± standard deviation (SD). Results were analyzed using non parametric 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 198 patients suffering from hypertension visiting the OPD in a period of 18 months were screened for enrollment in the study, 31 patients were not enrolled in the study as they did not fulfill the eligibility criteria for enrollment in the study. Around 15 patients were not included because they did not give the informed consent. A total of 152 patients participated in the study, the baseline demographics of the participants are shown in Table 1. The mean age of patients was 53.16±10.01 years, the mean number of medication used was 1.68±0.79 per person and 74% of

patients were taking combination of drugs for hypertension. The mean MMAS-8 Score was 4.30±1.07, the mean scores of WHO-QOL Bref scores are shown in Table 1.

Table 1: Baseline characteristic of participants

Characteristic	(n=152)
Age (years) (Mean±SD)	53.16±10.01
Sex(M:F)	80:72
Duration of illness (years) (Mean±SD)	4.76±2.53
Number of Medications used (Mean±SD)	1.68±0.79
% Medications as Drug Combination	74 % (n=112)
Morisky Medication Adherence Scale – 8 (MMAS-8) Score (Mean±SD)	4.30±1.07
Domain I/ Physical Health (Mean±SD)	10.84±1.25
Domain II/ Psychological (Mean±SD)	11.75±2.20
Domain III/ Social Relationship (Mean±SD)	11.67±3.87
Domain IV/ Envoirment (Mean±SD)	10.76±1.23

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. 79 patients were included in Group 1 and 73 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 2.41±0.50 medication per person for treatment of hypertension. The number of participants in Group 1 who were on single compound in one medication was 28 which was statistically ($p<0.05$) higher than participants in Group 2 (n=12). The mean duration of illness was significantly ($p<0.05$) less in Group 1 as compare to Group 2 (4.24±2.34 years vs. 5.32±2.62 years), the MMAS-8 scores were significantly ($p<0.05$) higher in Group 1 (4.65±1.20 vs. 3.93±0.77) – 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=79)	Group 2 (n=73)	p value
Age (years) (Mean±SD)	52.44±9.70	53.92±10.33	0.37[#]
Sex(M:F)	40:39	40:33	0.73[ø]
Duration of illness (years) (Mean±SD)	4.24±2.34	5.32±2.62	<0.05*[#]
Number of Medications used (Mean±SD)	1	2.41± 0.50	
Medications as Drug Combination (single drug: drug combnation)	28:51	12:61	<0.05*[ø]
Morisky Medication Adherence Scale – 8 (MMAS-8) Score (Mean±SD)	4.65±1.20	3.93±0.77	<0.05*[#]
Domain I/ Physical Health (Mean±SD)	10.86±1.26	10.82±1.25	0.85[#]
Domain II/ Psychological (Mean±SD)	11.67±2.26	11.84±2.15	0.62[#]
Domain III/ Social Relationship (Mean±SD)	11.96±3.88	11.34±3.86	0.33[#]
Domain IV/ Envoirment (Mean±SD)	10.76±1.22	10.75±1.26	0.98[#]
*p<0.05 and statistically significant			
[#]using student 't' test			
[ø]using Chi Square Test			

WHO-QOL Bref Scores

WHO-QOL bref scores are shown in Fig. 1. Group 1 had higher scores in 3 domains that is, physical health (10.86±1.26 vs. 10.82±1.25), social relationship (11.96±3.88 vs. 11.34±3.86) and environment (10.76±1.22 vs. 10.75±1.26) whereas Group 2 had higher scores in psychological (11.67±2.26 vs. 11.84±2.15) 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.

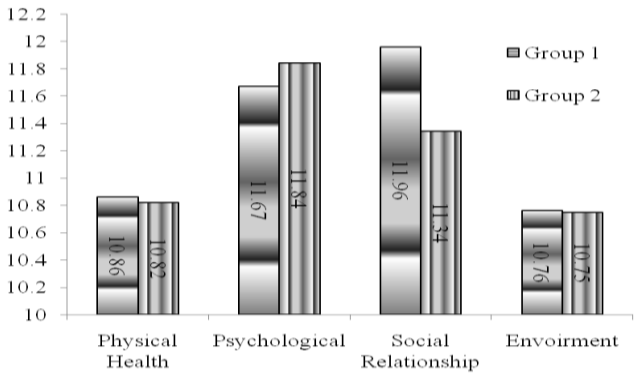

Fig. 1: WHO-QOL Bref scores in both groups

Correlation

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.

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=79)		Group 2 (n=73)	
	r	p	r	p
Domain I/ Physical Health	0.32	<0.05*	0.06	0.62
Domain II/ Psychological	-0.07	0.56	0.11	0.31
Domain III/ Social Relationship	0.29	<0.05*	0.06	0.59
Domain IV/ Envoirment	0.05	0.69	-0.05	0.69
*p<0.05 and statistically significant				

Discussion

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.[13] 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.[3]

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.[13]

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.[7]

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.[11]

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.[9]

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.

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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