Adherence to Pharmacological Treatment among Hypertensive Patients in Hypertension and Research Center, Rangpur, Bangladesh

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Poor adherence to blood pressure-lowering medication is a major reason for poor control of hypertension worldwide. Present study has undertaken in Hypertension and Research Center, Rangpur to assess the level of adherence to anti-hypertensive therapy and identified factors contributing to poor adherence among hypertensives. Four hundreds and twenty two (n=422) patients were interviewed using Morisky 8-Item Medication Adherence Questionnaire. High level adherence with treatment was observed in 51.66% of the respondents and low level and medium level adherence among the remainder. Patients with formal education, and higher monthly income were more adherent to treatment (χ^2=18.120, p<0.05 and χ2=8.192, p<0.05). In addition, those on single drugs were more adherent compared to those on two or more drugs (χ^2=20.546, p<0.05). Poor compliance was found to be mainly due to absence of symptoms (34.32%), normal blood pressure on previous visit (25.37%) and busy schedule (20.15%). Based on the findings of this study, there is a need for launching a comprehensive approach involving health care providers, patients and the general people to educating patients on the need to take their drugs regularly and in the manner prescribed.

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Key words: Adherence, hypertension, Morisky adherence scale

Introduction

Deveoping countries undergoing epidemiological transition face the double burden of communicable and non-communicable diseases.[1] Of the latter, hypertension is a major risk factor and a powerful predictor of cardiovascular morbidity and mortality[2-5] with proven benefits after treatment.[6-8] Control of hypertension protects against stroke, congestive cardiac failure, and all other causes of mortality.[3,4] Despite the availability of effective treatments, studies have shown that in many countries, less than 25% of patients treated for hypertension achieve optimum blood pressure.[9] The most important aims for the adequate control of hypertension are daily compliance and long-term adherence to therapy.[10]

Determinants of poor blood pressure control are many. Physician's roles in making appropriate treatment choices and optimizing doses of medicines prescribed are vital in ensuring the success of therapy. Additionally, patient's adherence to the prescribed antihypertensive medication is also an important factor in achieving blood pressure targets. Thus, health professionals need to work in partnership with their patients to achieve treatment goals.[11]

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Medication adherence is defined as "the extent to which the medication-taking behavior of a patient corresponds with agreed recommendations from a health care provider".[12] It is an important factor in achieving blood pressure control.[6] Patients that were adherent to the full regimen of their hypertension treatment were often significantly less likely to have uncontrolled blood pressures.[13,14] Unfortunately, poor adherence to medications is widespread especially in the treatment of chronic conditions such as hypertension leading to poor health outcomes and high morbidity.[15] Adherence to medication can be measured using direct method using biological test like serum or urine for drug level and indirect methods which include patient self-reports, pill counts, pharmacy refill rates and electronic medication monitors.[16] Interviewing patients with questionnaires or using patients' self-reports has the advantage of being simple and inexpensive to be carried out. Several self-reporting questionnaires have been developed to measure patients' adherence to prescribed medicines. One of the most frequently used is the Morisky Medication Adherence Scale of which the latest version contains eight questions to assess patients' adherence to medication-taking in an outpatient setting[17] (Table-I).

On the background of existing scarce study on adherence of medication among hypertensive, this study was conducted to assess the level of adherence to medications in hypertensive patients and to study factors that might affect adherence to antihypertensives in northern Bangladesh.

Methods

Place of Study

Hypertension and Research Center is the only primary hypertension care center in northern region of Bangladesh has the highest hypertensive patient attendance in the region. It serves the hypertensive patients of both urban and rural area from all the northern districts of Bangladesh. It is an established hypertension center with a registry.

Setting and Measurements

A cross sectional study done in the Hypertension and Research Center, Rangpur, Bangladesh during the period from January, 2015 to September, 2015 under the approval of ethical committee of the center. Total 422 primary hypertensive patients (n=422) of both sexes above 25 years attended ,confirmed diagnosis and registered the Hypertension and Research Center and received antihypertensive medications for at least three months were included in the study. Sample size was obtained using an appropriate statistical formula for estimating minimum sample size in health studies[14] .Patient having secondary hypertension, severe complications of hypertension and with severe systemic diseases were excluded from the study. All the included subjects were selected over the period of three months with their verbal consent and subjects were followed for at least 6 months and all the data recorded in the predesigned data sheet. During this time three blood pressure (BP) measures were taken in an interval of at least 4 weeks after patients being maintained on their mediation for at least 3 months. Clinically recognized and ideal methods for measurements of blood pressure has followed. Patients were labeled as uncontrolled hypertensive if the mean of three measures of systolic blood pressure (SBP) was ≥140 mmHg and /or diastolic blood pressure (DBP) was ≥90 mmHg.[1] Factors of non- adherence studied include demographic information, age, sex, education, socioeconomic condition, antihypertensive regime, patient knowledge of hypertension and whether they had complications such as neurological, cardiac or renal ones were recorded.

At the end of each follow-up patients adherence score was recorded by using Bengali translated version of Morisky 8-Item Medication Adherence Questionnaire (Table-I) through direct interviewing with the patient and average score were calculated at the end of last follow up. Patients level of adherence were categorized as low, medium and high level according to the average result of response of each visit where 1 for "Yes" and 0 for "No" response given for each question (Table II). Low adherent patients were asked about the reasons for their non-adherence with drugs. High level adherent patients with uncontrolled blood pressure were asked about their attitude towards the change of their medication and whether they were informed by their treating doctor about the need for such a change.

Statistical Analysis

Data were analyzed by using IBM SPSS statistics, 2015. Absolute numbers and simple percentages were used to describe categorical variables. Similarly, quantitative variables were described using measures of central tendency (mean, median) and measures of dispersion (range, standard deviation) as appropriate. The Chi-square test was used in assessing the significance of associations between categorical groups. A p-value of 0.05 or less was considered statistically significant.

Results

Of the 454 subjects recruited into the study, 422 has completed follow-up period of 6 months. The ages of patients ranged between 25 to 80 years with majority (43.60 %) were between 40-65 years of age. The mean age of subjects was 52.4 (SD±8.8) years and the male to female ratio was 1.3:1 (Table-IV).

Figure I showing the level of adherence to antihypertensives. Low level adherence was found in 31.75% respondents, medium level in 16.59% and high level adherence was found in 51.66% respondents.

Majority of respondents (65.40%) lived in urban area while the rest (34.60%) in rural areas. 13.04% of respondents had no formal education and rest (86.96%) of them had formal education (primary, secondary and tertiary education) .Monthly income of majority (73.93%) of the respondents were >10,000 taka per month and 26.07% earned <10,000 taka per month. Among the respondents 67.77% received once daily regime of antihypertensive and 32.22% received twice daily regime (Table IV). Low and medium level of adherence was found higher in 25-45 age group and statistically significant (p=0.000). Low and medium level of adherence was found predominantly in male but statistically not significant (p=0.413). Low level adherence found in respondents with no formal education and of lower socioeconomic status and residents of rural area which were statistically significant (p=0.000, p=0.016 and p=0.000). Low adherence also found in respondents received once daily regime and twice daily regime of antihypertensive (p=0.000). Uncontrolled blood pressure mostly found in low and medium level adherent patients than high level adherence group and it was statistically significant (p=0.000) (Table IV).

Factors associated with low and medium level of adherence was found to be mainly due to absence of symptoms 34.32% and normal blood pressure on previous follow up visit (22.38%). Busy schedule (20.15%) was another factor of low and medium level adherence. Other factors included forgetfulness (5.97%), non-availability of drugs in patients' place of domicile (5.22%), Ignorance and lack of knowledge about the importance of treatment (4.47%) exhaustion of prescribed drugs and non-attendance at scheduled day (3.37%), lack of funds to purchase drugs (2.23%) and 1.5% for side effects of drugs (Table V).

Table I: Morisky 8-Item Medication Adherence Questionnaire

Question	**Response score**	
	Yes	**No**
Do you sometimes forget to take your medicine?	**1**	**0**
People sometimes miss taking their medications for reasons other than forgetting. Thinking over the past two weeks, were there any days when you did not take your medicine?	**1**	**0**
Have you ever cut back or stopped taking your medicine without telling your doctor because you felt worse when you took it?	**1**	**0**
When you travel or leave home, do you sometimes forget to bring along your medicine?	**1**	**0**
Did you take all your medicines yesterday?	**1**	**0**
When you feel like your symptoms are under control, do you sometimes stop taking your medicine?	**1**	**0**
Taking medicine every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?	**1**	**0**
How often do you have difficulty remembering to take all your medicine? __ A. Never/rarely __ B. Once in a while __ C. Sometimes __ D. Usually __ E. All the time	**A = 0** **B-E = 1**	

Table II: Distribution of MMAS-8 Score (n=422)

Score	Number	%
0	218	51.56
1	31	7.35
2	39	9.24
3	24	5.69
4	15	3.55
5	30	7.11
6	29	6.87
7	25	5.92
8	12	2.84

0=High level adherence 51.66%
1-2=Medium Level adherence 16.59%
3-8=Low level adherence 31.75%

Table III: Comparing Compliance and Adherence

Compliance	**Adherence**
Clinician-centered	Patient-centered
Clinician dominance	Clinician–patient collaboration
Information is dictated	Information is exchanged
Goal: patient obedience	Goal: patient self-mastery
Activities are dictated	Activities are negotiated
Rules are dictated	Rules matched to lifestyle
Persuade, coerce	Discuss, negotiate, motivate
Resistance is not tolerated	Resistance provides information for adaptation

Table IV: Adherence according to the demographic and treatment variables

Variables	Total 422	Low level Adherence (n=124)(%)	Medium Level Adherence (n=70),(%)	High Level Adherence (n=218),(%	X^2	p
Age group (years)						
25-40	79 (18.72)	48(35.82)	26(37.14)	05 (2.29)	80.168	0.000*
40-65	184 (43.60)	45(33.58)	23(32.85)	116 (53.21)		
65-80	159 (37.68)	41 (30.60)	21(30)	97 (44.49)		
Gender						
Male	239 (56.63)	82 (61.19)	37 (52.85)	120 (55.05)	1.765	0.413
Female	183 (43.36)	52 (38.81)	33 ((47.14)	98 (44.95)		
Educational status						
No formal education	55 (13.04)	29 (21.64)	12 (17.14)	14 (6.42)	18.210	0.000*
Formal education	367(86.96)	105(78.36)	58 (82.86)	204(93.58)		
Residence						
Urban	276(65.40)	109 (81.34)	38 (54.29)	129 (59.17)	22.608	0.000*
Rural	146(36.40)	25 (18.66)	32 (45.71)	89 (40.83)		
Economic status						
<Tk.10,000/month	110(26.07)	46 (34.33)	12 (17.14)	52 (23.85)	8.192	0.016 *
>Tk.10,000/month	312(73.93)	88 (65.67)	58 (82.86)	166(76.15)		
Drug regime						
Once daily	286(67.77)	82 (61.19)	43(61.42)	177(81.19)	20.546	0.000*
Twice daily	136(32.22)	52 (38.81)	27 (38.57)	41 (18.81)		
Blood pressure						
Controlled	315(74.64)	47 (35.07)	61(87.14)	207(94.95)	165.959	0.000*
Uncontrolled	107 (25.36)	87 (64.93)	11(15.71)	9 (5.05)		

*All above values based on χ^2 test * Significant*

Table V: Factors responsible for low level medication adherence (n=134)

Factors responsible for	Frequency	%
Low adherence		
Absence of symptoms	46	34.32
Lack of funds to purchase drugs	3	2.23
Side effect of drugs	2	1.5
Non-availability of drugs	7	5.22
Exhaustion of prescribed drugs	5	3.73
Ignorance and lack of knowledge	6	4.47
Normal blood pressure during previous clinic visit	30	22.38
Forgetfulness	8	5.97
Busy schedule	27	20.15
Total	134	100

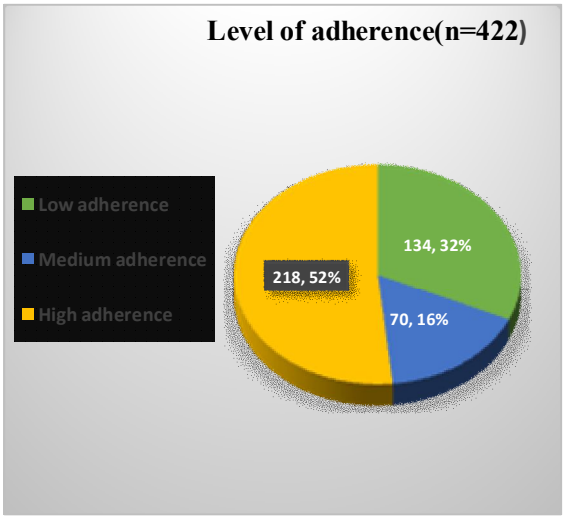

Fig I: Level of adherence to antihypertensive

Discussion

The most important aims for the adequate control of hypertension are daily compliance and long-term adherence to therapy.[10] The difference between compliance and adherence is not merely one of semantics (Table III). Rather, the difference is one of perspective and it is crucial. Compliance puts health care provider at odds with patients. Adherence puts them in partnership with the patient which offers a broader view in promoting positive health outcomes.

This study revealed that only 31.75% of the study population was low adherent to treatment. This finding not in consistent with the findings of a previous study done by Hussain and Ekram where they have reported 85% of their study population were non adherent to treatment.[18] This study was done in a inpatient department of a tertiary level hospital and in a private clinic where counseling with the patient may not be up to the mark which is the key point for increasing level of adherence to medication for any chronic disease.

On the other hand present study was done on registered hypertensive patient in Hypertension and Research Center which provides ideal antihypertensive care and treatment, highest possible ways of counseling and follow up based on organized registration database which makes the patients more adherent to treatment.

Another study done by Masuma Akther et al [19] has reported 25% of non adherence to antihypertensive treatment in rural Bangladesh. This findings also not in line with the findings of present study. In previous study, questionnaire on chronic disease lifestyle risk factors and management has used to assess the level of adherence. But in present study Morisky 8-Item Medication Adherence Questionnaire was used. This be another reason for difference in result.

In China and the Gambia, only 43 and 27% of patients with hypertension adhere to their antihypertensive medication regimen, respectively.[20,21] In developing countries, the magnitude of poor adherence is assumed to be higher given the scarcity of health resources and difficulties in access to health care.[22]

We have found that men hypertensives are most likely to poor adherent to treatment. Similar findings were observed in other studies.[23] However, opposing findings have also been reported.[24] Our study showed that young 25-40 hypertensive patients are less likely to continue antihypertensive treatment, in line with other findings.[25,26,27] As the symptoms go unnoticed, young individuals may not pay much attention to the importance of continuing medication.

Poor socioeconomic status and no formal education were important identified factor for poor adherence.[28,29,30] Our findings are in line with these evidences. People with formal education and higher socioeconomic status may be more health conscious and knowledgeable about the impact of poor control of high blood pressure.

The present study identified the factors responsible for lower level of adherence to antihypertensive was absence of symptoms and normal blood pressure on previous follow up visit. Busy schedule (20.15%) was another factor for low and medium level of adherence. Other factors included forgetfulness, non-availability of drugs in patients' place of domicile, traditional belief and misconception about antihypertensive drugs, exhaustion of prescribed drugs and non-attendance at scheduled time, lack of funds to purchase drugs and side effects of drugs. These

findings are also in line with the reported findings of other study.[1,18,19]

This study has done in a community based primary hypertension care center and highlighted demographic and economic factors, that influence adherence to treatment and also focused on the importance of health care providers in patient adherence to antihypertensive therapy, and the extent of poor adherence. A large scale field level study need to assess the level of adherence to antihypertensive in the community.

Based on the findings of this study there is a need for launching a comprehensive approach involving health care providers, patients and the general people especially with the aim of educating patients on the need to take their drugs regularly and in the manner prescribed to improve the level of adherence.

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