Factors Associated with Non-Adherence to Antihypertensive Medication among Hypertensive Patients in Community

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Access this article online
Quick Response Code
View PDF
Website: www.jkahs.org.np
DOI: http://dx.doi.org/10.3126/jkahs.v2i1.24417

ABSTRACT

Background: Hypertension is one of the common non-communicable health problems. While pharmacologic intervention is the most efficient way to control hypertension; non-adherence to medication is accounted as a significant cause for complications. This study was to address and to determine the magnitude of non-adherence among hypertensive patients by summarizing the associated risks factors among patients in the community level.

Method: This is a cross-sectional study conducted on hypertensive patients who visited the community health clinic at Dhading, Nepal on 9th and 10th June 2018 using a pre-structured questionnaire. Patients were sampled by nonprobability purposive sampling method. Effect of age, gender, marital status, employment, education level, presence of diabetes, cerebrovascular disease, current smoker, and family history of hypertension were analyzed by the compliance of antihypertensive drugs using frequency distribution, chi-square test, and logistic regression. For all of the analysis p-value < 0.5 was considered as significant.

Results: 150 patients were included in the study, out of whom 48 patients were found adherent and 102 patients non-adherent to antihypertensive medication. Out of total population 46% (n=69) were male and 54% (n=81) were female with no significant association between compliant and noncompliant groups (OR= 1.599, p>0.05). Mean age of patients in complaint group was 57 years and in the non-compliant group was 52 years with an odds ratio of 0.96 (p <0.05, 95% C.I : 0.933 - 0.987). However, there was no significant effect of marital status, employment status, and family history of hypertension on adherence to antihypertensive medication. Presence of diabetes had a significant effect on adherence to medication (OR=2.634, p<0.05). The most common reason for non-adherence was the fear of getting stuck with medication for lifetime (n=31, 30.3%) followed by the use of ayurvedic/ home remedy (n=27, 26.5%), unaware of complications (n=16, 15.7%), lifestyle modification (n=14, 13.7%), and financial weakness (n=9, 8.8%).

Conclusion: Fear of taking medication lifelong was the major reason for non-adherence; however, age and comorbid health conditions like diabetes have a significant effect on adherence to medication. Health care awareness and counselling can help these patients to overcome the fear of taking medication for a lifetime, which can increase the medication compliance rate.

Keywords: *Hypertension, Medication, Non-adherence, Compliant, Noncompliant*

INTRODUCTION

Hypertension (high blood pressure) is defined as systolic blood pressure greater than 140 mmHg or diastolic blood pressure greater than 90 mmHg.[1] Blood pressure is the force of blood pushing against the walls of the arteries that carry blood from your heart to other parts of the body.[2] Hypertension is one of the most prominent health problems in Nepal and across the globe. Different studies conducted in Nepal have shown that at least 30% of the sampled populations were suffering from the problem.[3,4] World Health Organization (WHO) estimates that hypertension causes about 12.8% deaths of all deaths in the world.[5] Incidence of hypertension is increasing every day. In United States of America, one third of the population is estimated to have high blood pressure.[6] In United States 47.5 % do not have controlled high blood pressure.[6] Hypertension is the major risks factor for cardiovascular and cerebrovascular disease, which was 10th leading cause of death in Korea in 2015 and 9th leading cause of death in 2016.[7]

Hypertension has been related to a wide range of risk from stroke, peripheral vascular disease, chronic kidney disease to eye damage.[8] Raised blood pressure is also a major risk factor for coronary heart disease and ischemic as well as hemorrhagic stroke.[5] If hypertension is left untreated it can lead to death. Hypertension can easily be controlled if followed proper treatment plan. About 20% of patients with hypertension have followed their treatment plan well enough to improve, and up to 25% of patients fail to even fill their initial prescription[9]. Right dosage of antihypertensive drugs can help control high blood pressure. Some other ways to control hypertension are daily habits such as exercises and diet. One of the effective ways to prevent cardiovascular and cerebrovascular disease could be hypertension control[10]

It is very crucial that patient stick to the treatment plan in order to control high blood pressure. Medication adherence is defined as extent to which patients take medications as prescribed by health care providers. Intentional non-adherence is defined as active process whereby the patient chooses to deviate from treatment regimen whereas unintentional as passive process in which the patient may be careless or forgetful about adhering to treatment regimen.[11,12] Adherence to a medications regimen can not only treat hypertension but also prevent adverse outcomes related to hypertension. Given the broad scope of the problem, ever increasing attention has devoted to identifying factors which contribute to non-compliance.[13] According to the WHO, "increasing the effectiveness of adherence interventions may have far greater impact on the health of the population than any improvement in specific medical treatments."[14] This study's aim is to address the magnitude of the problem of non-adherence to antihypertensive drugs in hypertensive patients and the factors associated with non-adherence.

METHODS

A cross sectional survey was conducted on hypertensive patients who attended hypertensive general health camp in Dhading district of Nepal on 9th and 10th June 2018. The Survey questionnaire was constructed after reviewing the literature on the topic, which included age, sex, marital status, employment, comorbidity, and reason behind not taking medications.

Table 1: Hypertension classification as per Joint National Committee (JNC) 7 report 15

Blood Pressure	Systolic Blood Pressure	Diastolic Blood Pressure
Normal	<120mmHg	<80mmHg
Prehypertension	120-139 mmHg	80-89mmHg
Stage 1 hypertension	140-159 mmHg	90-99 mmHg
Stage 2 hypertension	≥160mmHg	≥100 mmHg

The target population of the survey was adult hypertensive patient attending in general health camp conducted by Dhading District hospital on 26 and 27 Jestha, 2075 B.S (June 9 and 10, 2018). The sample used was all the hypertensive patient who attended the general health camp. The primary investigator trained a team of five health workers on using the survey form for data collection to ensure uniformity of data collection.

Patient who were eligible to participate in the survey were those who had been diagnosed with hypertension for > 6 month and were 18 years and older. Pregnant, patient with psychiatry illness and those who refused to participate in survey were excluded. The doctor and the trained personnel measured the blood pressure by manual adult blood pressure measuring cuff. The blood pressure reading was taken on sitting position after rest for 5 minutes of signing up in the camp. The systolic blood pressure of more than 140 and diastolic blood pressure of more than 90 mmHg was double checked and confirmed.

SAMPLE SIZE AND STATISTICAL ANALYSIS:

All those patients who qualified for the study were taken as a sample for the study. Total of 150 patients were analyzed by method of nonprobability purposive sampling method.

Categorical variable was analyzed using frequency and percentages. Chi-square test was used to analyze the association of risk factors with non-adherence to antihypertensive medicines. Binary logistic regression was used to quantify the strength of association of risk factors with non-adherence to anti-hypertensive medication and also to analyze effect of confounding factors between the two groups (adherent and non-adherent). All analyses were done using IBM SPSS 25.0.

RESULTS

Total of 150 samples were analyzed; out of which 32% (n=48) were complaint to medication while 68% (n=102) were in non-compliant group. Mean age was 57 years in adherent group and 52 years in non-adherent group (OR= 0.96, p=.01 and 95% C.I = 0.932-0.990). 37.5% male were in adherent group (n=26) and 62.3% in non-adherent group while female was 27.2% and 72.8% respectively (OR= 1.512, p=.292, 95% C.I 0.762-3.354). Marital status, employment status and comorbid conditions, current smoker were not significantly difference between the groups. 54.5% were diabetic in adherent group while 45.5% were in non-adherent group (OR=2.634, p<0.05, 95% C.I = 0.978-7.092). (Table 1)

Table 1: Frequency analysis of demographic and laboratory variables

		Compliance to medicine							
		Yes		No		Odds Ratio	95% Confidence Interval		
		N	%	N	%		p-value	Lower	Upper
Gender	Male	26	37.7%	43	62.3%	1.599	0.214	0.762	3.354
	Female	22	27.2%	59	72.8%				
Marital status	Single (Reference for OR)	0	0.0%	3	100.0%				
	Married	47	32.9%	96	67.1%	0.00	0.99	0.0	0.0
	Divorced/widow	1	25.0%	3	75.0%	0.0	0.99	0.0	0.0
Employment status	Employed (Ref.for OR)	13	31.0%	29	69.0%				
	Housewife	27	28.1%	69	71.9%	1.159	0.727	0.506	2.658
	Peasant	6	66.7%	3	33.3%	0.167	0.031	0.033	0.849
	Others	2	66.7%	1	33.3%	0.190	0.198	0.015	2.374
Diabetes	Yes	12	54.5%	10	45.5%	2.634	0.055	0.978	7.092
	No	36	28.1%	92	71.9%				
Current smoker	Yes	8	32.0%	17	68.0%	0.593	0.311	0.216	1.629
	No	40	32.0%	85	68.0%				
CVD	Yes	1		3		0.705	0.773	0.066	7.572
	No	47		99					
Comorbid Condition	Not known Ref. for OR)	31	29.2%	75	70.8%				
	DM	11	52.4%	10	47.6%	0.292	0.017	0.106	0.803
	High cholesterol	5	26.3%	14	73.7%	1.020	0.973	0.318	3.277
	Stroke	1	25.0%	3	75.0%	0.989	0.993	0.096	10.241
Family hypertension	Yes	7	30.4%	16	69.6%	0.709	0.517	0.250	2.007
	No	41	32.3%	86	67.7%				
Age in years		48	32.0%	102	68.0%	0.96	0.01	0.932	0.990
Mean Age		57		52					

Note: Abbreviation, OR= odds ratio, CVD: cardiovascular disease, DM= Diabetes Mellitus

Patients were non-adherent to medication mostly because of fear to take lifelong (Chi-square test=18.39, $p<0.05$) followed by preference to ayurvedic medicine/home remedy (Chi-square test=16.201, $p<0.05$). Unaware of complication, adoption of lifestyle modification and financial weakness are other cause for non-adherence. (Table 2)

Table 2: Risk factors associated with non-adherence to antihypertensive medication

Reason for not taking medicines	Adherence to medicine				Test statistics	
	Yes	Percent	No	Percent		
	Count		Count		Chi-square Value	P- value
Has to take life long	0	0.0%	31	30.3%	18.39	0.000
Lifestyle modification	0	0.0%	14	13.7%	7.266	0.007
Taking Ayurvedic medicine/ home remedy	0	0.0%	27	26.5%	16.201	0.000
Does not know about the complication	0	0.0%	16	15.7%	8.428	0.004
Financial weakness	0	0.0%	9	8.8%	4.506	0.034

DISCUSSION

Prevalence of hypertension is raising everyday all over the world and the complications associated with hypertension are also increasing. Major factor associated with uncontrolled hypertension is non-adherence to medications. This study attempted to reveal some factors associated with non-adherence to antihypertensive medications. Complaint group had 32% (n=48) of participants while 68% (n=102) were in non-compliant category. It was similar to the study of Bioma et al. in which 66.7% of participants were under non-adherence to medications group.[16] In contrast, survey conducted in Seoul, Korea and Saudi Arabia showed only 13.2% and 23.6% of non-adherence respectively.[17,18] Adherence to medication in these studies was significantly higher than our study.

Factors such as gender, marital status, employment status, comorbid current smoker, and comorbid conditions were not significantly different between the groups. Similarly, in the study by Bioma et al, there were no differences in medication adherence between patients who were married compared with those who were not.[16] In the study done in Czech and U. K., females were more commonly non-adherent to anti-hypertensive drugs than male which matches our study results however, our results weren't statistically significant (p=0.292).[19]

There were 54.5% diabetic patients in adherent group and 45.5% in non-adherent group (OR=2.634, p<0.05, 95% C.I: 0.978-7.092). This shows that the chances of non-adherence to antihypertensive medication increase if a patient is diabetic. Age was also observed to be statistically significant. Mean age was 57 years in adherent group and 52 years in non-adherent group (OR=0.96, p<0.05 and 95% C.I.: 0.932 - 0.990) indicating its significance for the adherence to medication. In Ghobain et al study, age (≤65 years), poor monitoring, and uncontrolled blood pressure (BP ≥140/90 mmHg) were the predictor factors associated with nonadherence.[18] In contrast, a study conducted in UK and Czech population, age was inversely related to non-adherence.[19]

Patients were non-adherent to medication mostly because of fear to take medicine lifelong, followed by preference to ayurvedic medicine/home remedy. In a study by Bioma et al non-adherence was significantly more common among patients who used herbal preparation for the treatment of systemic hypertension (p = 0.014).[16] Another study conducted on Lebanese population showed forgetfulness (p =0.01), complicated drug regimen (p = 0.001), and side effects (p = 0.006) as predictors of low adherence after multiple liner regression.[20] Younger and less educated groups were less likely to adhere to prescribed medication.[17] Poor knowledge about the disease and possible implications associated was reported in 80% of patients, while 66% of the patients had poor monitoring. Furthermore, financial weakness also had some association to the non-adherence to medication because of economic burden.

Though not a part of this study but studies have demonstrated that once-daily antihypertensive medications have the highest adherence compared with twice daily or multiple daily doses, including greater adherence to the prescribed timing of doses.[21] This study was a community-based survey; so, a larger inclusive study involving different communities is required before generalizing the findings. Similarly, according to a study conducted by Gupta et. al. each increase in the number of antihypertensive medications led to 85% and 77% increase in non-adherence ($P<0.05$) in the UK and Czech respectively.[19]

CONCLUSIONS

Fear to take lifelong medication was the most common reason for non-adherence; however, age and comorbid health condition like diabetes also affect significantly on adherence to medication. Proper counseling and awareness towards antihypertensive medications should be done to increase compliance to medication.

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How to cite this article?

Shrestha TM, Bhusal L, Raut S, Ghimire R, Shrestha P. Factors Associated with Non-Adherence to Antihypertensive Medication among Hypertensive Patients in Community. Journal of Karnali Academy of Health Sciences. 2019;2(1):53-59

Conflict of Interest: None Source of Support: None