

Factors Associated with Non-Compliance of Medications in Hypertensive Patients

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Abstract:

Objectives: To determine different factors associated with non-compliance to anti-hypertensive medications.

Methods: Patients diagnosed as suffering from hypertension and either taking or had taken treatment in the past were included in the study. Study Questionnaires was filled by investigators (consultants, Registrars and PG students) during face to face clinical encounters with hypertensive patients who had been non-compliant to anti-hypertensive medications. Statistical analysis was performed by using SPSS-21 software. Factor analysis was performed for assessing the validity of the responses for the 20 items present in the questionnaire for a sample comprising of 300 hypertensive patients.

Results: The Principal Component Extraction Analysis showed several factors associated with non-compliance to medications. Some patients did not have easy access to their treating physician (0.83) while others did not have any significant change or improvement in their health by using anti-hypertensive medication (0.83). Long Distance from health facility (0.75), difficulty in sparing time (0.74), polypharmacy (0.70), lack of symptoms (0.67), forgetfulness (0.67), high cost of the treatment (0.59), undesirable side effects of anti-hypertensive drugs (0.50) and lack of family support (0.45) were contributing towards non-adherence to antihypertensive treatment in this cohort of patients.

Conclusion: There are number of factors associated with non-compliance of anti-hypertensive medications. The knowledge of these factors will help to develop effective interventions with deeper understanding to overcome the non-compliance in hypertensive patients.

Key words: Hypertension, non-adherence, anti-hypertensive treatment

Introduction

Hypertension is a common disorder and is a major risk factor for stroke, myocardial infarction and renal disease¹. The sequelae of hypertension can only be avoided by prolong and effective pharmacotherapy on regular basis. On the other hand, non-adherence to anti-hypertensive medication is common and it has been estimated that at least 50% patients who are suffering from hypertension are not taking anti-hypertensive medications regularly. The National Health Survey of Pakistan estimated that hypertension affects 18% of adults and 33% of adults above 45 years of age². The magnitude of this condition and non-compliance is huge in the world's fifth most populous country with more than 200 million inhabitants.

There are several factors associated with non-compliance of anti-hypertensive medications. There may be different reasons in different cultures, socio-economic and demographic conditions³. As there is no study from this part of country, knowledge of these factors will help to plan strategies to improve compliance of anti-hypertensive medications.

Material & Methods

Research question: What are the most important factors associated with non-compliance of anti-hypertensive medications in district Muzaffarabad of AJK.

Objective of the study: To determine different factors associated with non-compliance to anti-hypertensive medications.

Operational definitions:

Non-Compliance: Patients who did not adhere to the prescribed dosage or frequency of anti-hypertensive medications and those who stop and start treatment. Non-compliance was further categorized as

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often (those who frequently missed their prescribed medicines) and occasionally (those who occasionally missed their prescribed medicines).

Venue/Setting: The study was conducted in Abbas Institute of medical Sciences Muzaffarabad AJK.

Study design: Quantitative Exploratory study

Sampling technique: Purposive, convenient sampling.

Sample size: was calculated by the following formula: $Z \frac{1-a}{2} \frac{2P(1-P)}{D^2}$

Inclusion criteria: All patients diagnosed as suffering from hypertension and either taking or had taken treatment in the past.

Exclusion criteria: All patients diagnosed with hypertension and taking treatment regularly and did not miss their medications.

Procedure: Study Questionnaires was filled by investigators (consultants, Registrars and PG students) during face to face clinical encounters with hypertensive patients who had been non-compliant to anti-hypertensive medications.

Statistical analysis: Statistical analysis was performed by using SPSS-21 software. Factor analysis was performed for assessing the validity of the responses for the 20 items present in the questionnaire for a sample comprising of 300 hypertensive patients.

Results

There were 300 participants (Male 34%; Female 66 %) in the study. Forty percent of these patients were missing their medication very often while 60% were missing occasionally. The general characteristics in this cohort of patients are shown in table-1. The known duration of hypertension was less than 15 years in 91% of patients. There were other comorbidities in 67% patients while 33 % were suffering from hypertension alone. The significant majority of these patients were illiterate (60%) while 40% patients were educated at different levels. The monthly income was between 16,000-30,000 rupees in 52% of patients while it was more than 31,000 rupees in 33%.

The Principal Component Extraction Analysis (table-2) showed several factors associated with non-compliance to medications. The majority of these patients did not have easy access to their treating physician (0.83). Another factor was disbelief for any significant change or improvement in their health by using anti-hypertensive medication (0.83).

Distance from health facility (0.75) and sparing time (0.74) to visit a doctor was also contributing towards non-compliance. The polypharmacy (0.70) and large

number of tablets were also significant factors over time stopping the patients from taking regular treatment. As majority of patients did not have active complaints, this lack of symptoms (0.67) and forgetfulness (0.67) was also responsible for poor compliance. Another significant factor was the cost of the treatment (0.59) as patients were unable to afford expensive treatment. There was no immediate improvement in the quality of life (0.54) with these medications hence patients were not taking their medicines regularly. The undesirable side effects of anti-hypertensive drugs (0.50) were also contributing towards poor compliance.

Six principal factors were extracted; variance explained in Table 3 and in scree plot (graph-1). These six principal components associated with non-compliance were then analyzed on Varimax rotation with Kaiser Normalization and are shown in table-4.

Factors loading on component 1 were: Non-availability of medicines (0.80), long distance from health facility (0.61), taste of medicines (0.51), high cost of treatment (0.49) and large number of tablets (0.35).

Factors loading on component 2 were: forgetfulness (0.76), no improvement in quality of life (0.70), lack of family support (0.45) and disbelief in medicines as lifesaving.

Following factors were loading on component 3: Large number of tablets (0.73), disbelief in medicines as lifesaving (0.68) and side effects of drugs (0.66).

Factors loading on component 4 were: long distance from health facility (0.59), disbelief in medicines as lifesaving (0.30) and lack of easy access to the treating physician (0.89).

These factors were loading on component 5: High cost of treatment (0.30), having no active symptoms (0.76) and difficulty in sparing time (0.69).

Factors were loaded on component 6 were: Expensive treatment (0.38), lack of symptoms (0.35) and distrust in treatment (0.86)

Discussion

Non-compliance to prescribed anti-hypertensive medications is a major problem in clinical practice. There are different determinant of non-compliance based on beliefs and behaviors in a complex social context⁴. This study showed a wide variety of factors associated with non-compliance in this sub-Himalayan region in the north-east of Pakistan. However, the importance and relevance of these factors in this particular terrain and social setup may be different from other parts of the country. The knowledge of

Table-1

Characteristics	Number of patients (percentage)
Duration of HTN	
• less than 5 years	131 (44)
• 6-10 years	108(36)
• 11-15 years	34(11)
• 16-20 years	17(6)
• more than 20 years	10(3)
Frequency of missing the dose	
• occasionally	180(60)
• often	120(40)
Other diseases (comorbidities)	
• yes	202 (67)
• no	98(33)
Education	
• Illiterate	182(60)
• Primary	50(17)
• Matriculate	44(15)
• Graduation	19(6)
• Post-graduation	5(2)
Monthly Income (Rupees)	
• < 15000	46(15)

• 16000-30000	155(52)
• 31000-45000	44(15)
• 46000-60000	18(6)
• >61000	37(12)

Ttable-2: Communalities

Factors associated with non-compliance	Initial	Extraction
Access to doctor	1.000	.835
Distrust	1.000	.833
Beliefs	1.000	.802
Distance of health facility	1.000	.756
Sparing time	1.000	.747
Number of tablets	1.000	.701
Forgetfulness	1.000	.675
Symptoms	1.000	.672
Non availability of medicines	1.000	.669
Cost of treatment	1.000	.596
Quality of life	1.000	.541
Side effects	1.000	.503
Taste	1.000	.479
Family support	1.000	.291

Extraction Method: Principal Component Analysis.

Total Variance Explained (table-3)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.150	15.356	15.356	2.150	15.356	15.356
2	1.840	13.145	28.501	1.840	13.145	28.501
3	1.495	10.677	39.178	1.495	10.677	39.178
4	1.385	9.893	49.071	1.385	9.893	49.071
5	1.169	8.350	57.421	1.169	8.350	57.421
6	1.063	7.592	65.013	1.063	7.592	65.013
7	.927	6.624	71.637			
8	.895	6.395	78.032			
9	.808	5.769	83.801			
10	.607	4.333	88.134			
11	.570	4.069	92.203			
12	.498	3.559	95.762			
13	.335	2.394	98.157			
14	.258	1.843	100.000			

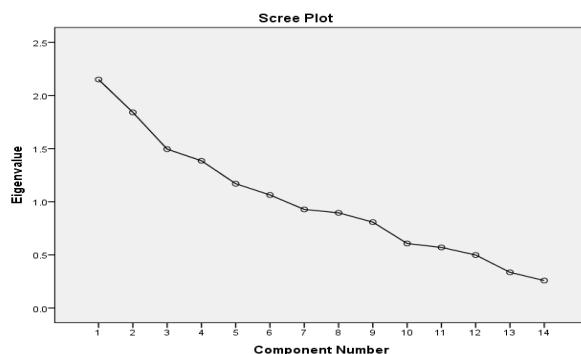


Table-4: Rotated Component Matrix

	Component					
	1	2	3	4	5	6
Non availability of medicines	.800					
Distance of health facility	.613			-.598		
Taste	.515					
Cost of treatment	.496				-.304	.386
Forgetfulness		.766				
Quality of life		.709				
Family support		-.452				
Number of tablets	.353		.738			
Beliefs		.377	.689	-.365		
Side effects			.660			
Access to doctor				.895		
Symptoms					.767	
Sparing time					.694	.358
Distrust						.865

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 10 iterations.

important factors responsible for non-compliance will help to plan strategies to overcome this problem.

The non-adherence to antihypertensive therapy is a universal problem. The rates of non-compliance are very high even in Europe where one study showed 41.6% and 31.5% in the UK and Czech populations, respectively⁵.

Having no easy access to the treating physician was one of the most important factors contributing towards non-compliance. Patients were prescribed medicines for a certain period of time and they stopped taking or took their medicines irregularly till next visit to their physician. The terrain, road network, climate, under developed health infra structure and non-availability of specialist doctors in the far flung areas were contributing towards lack of easy access to treating physicians.

Distrust in treatment and disbelief in anti-hypertensive medications as lifesaving treatment was another factor responsible for non-compliance. As most of these patients did not have active complaints and they do not feel any change or improvement in their health with or without anti-hypertensive medications. They did not believe that using these medications will bring any substantial change in their health, consequently culminating in poor compliance. The study by Polinski and colleagues had shown that distrust in diagnosis of hypertension and need for anti-hypertensive medication was a significant barrier to non-adherence to anti-hypertensive medications⁶.

Non-availability of drugs (prescribed brands) near home was another important factor for non-compliance. Most of the time these were common generics but there was non-availability of the prescribed brand and patients were reluctant to accept any brand other than the prescribed one.

The distance from the nearest health facility was another factor for non-compliance. The majority of these patients were travelling long distances to reach the nearest health facility. As substantial part of this journey is on foot in this area, it was difficult for elderly patients to manage visits to their physicians. The other factor was time management for hospital visits. These patients were accompanied by close family members and all have to spare time simultaneously for this purpose.

It was difficult for some patients to take large number of tablets and adhere to multiple dosage schedule daily. There are several studies which have shown inverse relationship between polypharmacy and drug compliance of patients⁷. There were few patients who forgot to take their medications on regular basis. Forgetfulness is an important problem, not limited to anti-hypertensive medications, especially in elderly patients who regularly forget to take their medications⁸. The cost of treatment was also responsible for poor compliance as few patients were unable to afford expensive treatment on regular basis. A survey in United States showed that as many as three of four Americans did not take medications as prescribed. Another survey by CVS Caremark of more

than 2,400 of its retail pharmacists revealed 62 percent believed the high cost of drugs is the biggest reason for not taking the prescribed medications⁹. The average monthly income of families in this study was between 15-30 thousand rupees in 52% of patients while it was less than 15 thousand in 15 %. In these families it was a matter of bread on the table or drug for hypertension. There is only limited free supply of some antihypertensive drugs in Government Hospitals and availability is subject to budgetary constraints and prevailing policies. There is lot of social support for some diseases like end stage renal disease or thalassemia but it is almost non-existing for anti-hypertensive medications.

The side effects of drugs was another factor responsible for non-compliance as some patients stopped taking medications while others were irregular or reduced the dosage on their own. A study by Yacob G Telda found excessive urination and decreased sexual derive were the most significant undesirable side effects associated with non-adherence to antihypertensive medications¹⁰.

The most important combinations of factors associated with non-compliance were non-availability of medicines, long distance from nearest health facility, cost of treatment, taste and large number of tablets. This combination of factors was more relevant and specific for this remote area of the country with difficult terrain, cold weather, snow fall, closure of seasonal roads and under developed health infrastructure in the periphery. The other combination of factors was forgetfulness, no immediate improvement in quality of life with or without taking medicines, lack of family support and disbelief in medicines as these were life saving for the patient.

The knowledge of these factors will help to develop effective interventions with deeper understanding to overcome the non-compliance in hypertensive patients. There are few personal factors which need better counseling of patients to emphasize the life-saving importance of anti-hypertensive medications at the cost of some side effects. A meta-analysis estimated that patients whose physicians communicate 'well' have 19% higher compliance and that training physicians in communication skills can improve adherence by 12%¹¹. It is also imperative for treating physicians to optimize the cost of treatment in accordance with economic conditions of the patients.. A study by Kronish IM showed approximately 50% of patients with cardiovascular disease have poor adherence to their prescribed medications and cost of treatment was a major factor¹².The cost of treatment

was an important factor in non-compliance and judicious prescriptions can always be helpful to reduce the cost of life long treatment. The health department needs to play more proactive role to prioritize the free and easy availability of anti-hypertensive drugs at health facilities

Limitations

This was a small study in the area which is relatively remote, with hilly terrain, harsh weather conditions and unique social setup. The results of this study may not be generalizable.

Conclusion:

Hypertension is a common condition responsible for serious complications in spite of availability of effective medications for its treatment. There are number of factors associated with non-compliance of anti-hypertensive medications. The knowledge of these factors will help to develop effective interventions with deeper understanding to overcome the non-compliance in hypertensive patients.

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Study Questionnaire

Name					
sex: M F					
Marital status:					
Add:					
Age (years):	30-40	41-50	51-60	61-70	>71
Duration of HTN(years):	< 5	6-10	11-15	16-20	>21
Education	Illiterate	Primary	Matric	Graduation	Post-graduation
Monthly Income (Thousands):	< 15	16-30	31-45	46-60	>61
How many times have you been advised to take Medicines?				1 2 3	
How often you miss your medicines?				Occasionally often	
Do you consider your life can be in danger due to your hypertension (denial of problem)				Yes No	
Do you have any disease other than HTN? (multiple conditions)				Yes No	
What disease/s you have other than HTN?				1- 2- 3-	
What is the main reason for not taking your medicines regularly?					

Does cost of treatment is factor for not taking treatment? (cost of treatment)	Never	Occasionally	Always
Do you have problem with large number of tablets you are taking for your diseases? (polypharmacy)	Never	Occasionally	Always
Do you consider these drugs are GARAM? (beliefs)	Never	Occasionally	Always
Are you afraid of harmful effects of these drugs? (side effects)	Never	Occasionally	Always
Do you forget to take medicines (forgetfulness)	Never	Occasionally	Always
Have taste of medicine caused any problem?	Never	Occasionally	Always
Do you have easy access to your doctor?	Never	Occasionally	Always
Can you manage time to visit your doctor and get medicines (sparing time)	Never	Occasionally	Always
Is non-availability of drugs near your residence is contributing towards non-compliance?	Never	Occasionally	Always
Do you believe that taking these medications will improve your health? (distrust)	Never	Occasionally	Always
Do you believe that these medications had no effect on quality of your health? (distrust)	Never	Occasionally	Always
Does distance to health care facility contributes toward non-compliance?	Never	Occasionally	Always
Is there some family member who supports, insists and reminds you for medication?	Never	Occasionally	Always