



RISK FACTORS AFFECTING NON-COMPLIANCE OF DRUG THERAPY AMONG HYPERTENSIVE PATIENTS AT CHERLAPALLY, INDIA

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ABSTRACT

Objective: Purpose of the study was to identify risk factors affecting the non-compliance of drug therapy among patients with hypertension.

Methods: A Cross-sectional community based study was carried out among already diagnosed 300 hypertensive patients to assess non-compliance of drug therapy among patients with hypertension. Primary outcome-non-compliance measured in percentages, proportions using chi-square; adjusted and unadjusted odds ratios (ORs) based on logistic regression models were used for statistical analysis.

Results: Total subjects who did not take antihypertensive medication were 38 (13%). Non-compliance among Gender and occupation groups was significant (p-value<0.05). Unadjusted analysis showed statistically significant association between noncompliance and Gender (OR of 2.444); Occupation (OR of 0.146) in dependents; (OR of 0.122) in unskilled and (OR of 0.143) in skilled workers; Co-morbidities (OR of 2.667); and Physical exercise (OR of 3.453) but adjusted analysis showed significant association between noncompliance and gender only.

Conclusions: Active patients' collaboration for treatment compliance should be directed towards rural illiterates by primary health care providers.

Keywords: Hypertension, drug therapy, non-compliance

INTRODUCTION

Hypertension is an important condition among adults, affecting nearly one billion people worldwide. In terms of attributable deaths, raised Blood Pressure (BP) is one of the leading behavioral and physiological risk factor to which 13% of global deaths are attributed. It is reported to be the fourth leading contributor to premature death in developed countries. World population has an overall prevalence of 32.3% (95% confidence interval, CI 28.9 to 35.8)¹. In India, 23.10 % men and

22.60 % women over 25 years old suffer from hypertension, says the World Health Organization's global health statistics 2012². Although a broad range of hypertension medications have been demonstrated to reduce BP and its control is an achievable goal, reports suggest that up to two thirds of patients with hypertension are not successfully treated, that is, achieve BP control³. Increased blood pressure is a high-risk condition that causes approximately 51 per cent deaths from stroke and 45 per cent from coronary artery disease in India. It was directly responsible for

7.5 million deaths in 2004 -12.8 per cent of the total global deaths. The report said high blood pressure is a modern epidemic, characterized as a "silent killer" because it shows negligible symptoms. Control of blood pressure can be accomplished through medication regimens, and this is known to improve morbidity and mortality even for borderline hypertensive patients. Yet, many patients with hypertension do not comply with prescribed regimens.⁴ Similarly, other studies suggest that the treatment's efficacy, in patients under care, is attenuated mainly by patient non-compliance with medication and lifestyle advice.⁵ A major reason for lack of BP control is failure by patients to use medications as prescribed⁶. It is a modifiable cause to comply with prescribed medications. Appropriate use of medications includes compliance, taking medications at the prescribed frequency/interval and dose/dosing regimen, and persistence, continuing their use for the specified treatment time period, which, in the case of hypertension therapy, is usually lifelong.⁷ Poor compliance with hypertension medications is associated with adverse health outcomes. However, compliance with treatment is often sub-optimal, especially in developing countries. In fact, it has been estimated that only 60% of patients take medication as prescribed.⁶ To minimize unnecessary expenditure and to improve the health and quality of life of patients with hypertension, it is crucial to explore the relationships between the characteristics of patient medication and health system to compliance. Given the broad scope of the problem, ever-increasing attention has been devoted to identifying risk factors which contribute to non-compliance.³ Majority of these studies were conducted in clinical / hospital settings and emphasized mainly on urban subjects. Only few studies address the medication adherence pattern of rural hypertensive subjects.⁸ Hence the present study investigated the socio-demographic factors associated with non-compliance among hypertensive subjects in a rural community in India

METHODS

This cross-sectional community based study was conducted to assess risk factors for non-compliance of hypertensive patients in field practice area of Rural Health Training Centre (RHTC), Cherlapally, Nalgonda district, in Telangana state, which is in the southern part of India. RHTC covers a population of 1,700 spread out in 11 villages. The study subjects comprised of hy-

pertensive patients who were diagnosed and receiving treatment for hypertension from a qualified physician. Data was collected from July to December 2013. They were selected by simple random technique.

The sample size of 306 (rounded off to 300) was calculated based on estimated proportion of non-compliance of 15% (R.Susan's study conducted in south India, 2012⁹) using the formula $n = Z^2p(1-p)/e^2$ (n = is the required sample size; Z =standard normal deviate corresponding to 95% confidence level of 1.96; p =estimated proportion of non-compliance of 15%, e =margin of error of 4%. Inclusion criteria were: anyone between the ages of 25 and above, being treated with anti hypertensive drugs for >3 months. Exclusion criteria were: Patients with prior history of MI, Patients with a stroke, Patients considered to have transient ischemic attack & Patients who had renal failure, in an attempt to standardize the analysis of non-compliance in these patients, we thought it was to appropriate to restrict study subjects without complications. It is possible that the degree of compliance may increase in those patients. The operational definition of non-compliance to drug therapy was defined as "the extent to which patients did not follow their medication schedules as prescribed by their health care providers for the last 15 days. This short period was chosen to minimize recall bias. The trained Medical students interviewed the study subjects in local languages, i.e. Telugu and Hindi. Pre-tested Structured Questionnaire was used to record data. No surrogate responses were permitted.

A total of 300 subjects (124 men and 176 women) participated in the study. Social class of caste was assessed as per Social Welfare Department, Government of Andhra Pradesh. They were coded as Open category (OC), Backward Class (BC), Scheduled Caste (SC), Scheduled Tribe (ST). Occupation was assessed following the standard Indian classification system and coded as follows skilled workers, unskilled workers and professionals.⁷ Additional category was "dependents", which included housewives. Education level was classified as illiterate and literate. Data on age, Gender, type of family, presence of comorbidities (Diabetes, Tuberculosis, Asthma, Chronic Bronchitis), salt intake (more than 5 gm/day), Alcohol use, Tobacco abuse, over weight (BMI >25), Physical exercise (20mts of moderate exercise/day) and Health insurance coverage was also collected. The primary outcome in this present analysis was non-compliance. A Chi-square test was used to com-

pare the non-compliance considering the different demographic and socio-economic categories. Unadjusted odds ratio (OR) with the 95% confidence interval (95% CI) were calculated for the various socio-demographic characteristics against treatment non-compliance. The same variables were included for multiple logistic regression analysis, with treatment non-compliance as the dependent variable and the socio-demographic characteristics as the independent variables. All statistical analysis was performed using Statistical -package for Social Sciences (SPSS Inc, Chicago and III) 19th version. P <0.05 was considered as significant.

RESULTS

As shown in table-1, 149 (53%) of subjects were above ≥60 and 74 (25%) were between 50-59 yrs of age, women represented 176 (59%) of the sam-

ple. Unskilled workers were 165 (55%), Hindus 277 (92%), SC, ST & BC 236 (79%), married and living with spouse 229 (76%) and 80 (27%) of them had a per-capita income of 500-1245. The patients who were either overweight or obese were 98 (27%); smokers 70 (23%); alcohol users 96 (32%); who did physical exercise 89 (30%); who used excess salt 61(20%); and with co-morbidities 222 (74%). The total subjects who did not take antihypertensive medication was 38 (13%), more of Males 23 (8%), Illiterates 25 (8%), Unskilled workers 18 (6%), Hindus 36 (12%), Scheduled caste, Scheduled Tribes and Backward caste together 29 (10%), Nuclear families 28 (9%), married and living with spouse 27 (9%) and per-capita income up to Rs. 2489 per month 28 (10%). However non-compliance among Gender and occupation groups was significant (p-value<0.05)

Table 1: Socio-Demographic Characteristics of the Study Population

Characteristic	Non-Compliance (n=38) (%)	Compliance (n=262) (%)	Total (n=300) (%)	p-value
Age in years				
30-39	05 (02)	22 (07)	27 (09)	0.489
40-49	05 (02)	35 (11)	40 (13)	
50-59	06 (02)	68 (23)	74 (25)	
>=60	22 (07)	137 (46)	149 (53)	
Sex				
Male	23 (08)	101 (34)	124 (42)	0.010*
Female	15 (05)	161 (54)	176 (59)	
Education				
Illiterate	13 (04)	76 (25)	89 (29)	0.511
Literate	25 (08)	186 (62)	211 (70)	
Occupation				
Dependent	06 (02)	41 (14)	47 (16)	0.014*
Unskilled	18 (06)	147 (49)	165 (55)	
Skilled	10 (03)	70 (23)	80 (26)	
Professional	04 (01)	04 (01)	08 (02)	
Religion				
Hindus	36 (12)	241 (80)	277 (92)	0.324
Muslims	01 (0.3)	19 (6.7)	20 (07)	
Christians	01 (0.3)	02 (0.7)	03 (01)	
Caste				
Other Caste	09 (03)	55 (18)	64 (21)	0.705
SC,ST & B.C	29 (10)	207 (69)	236 (79)	
Type of Family				
Nuclear	28 (09)	196 (65)	224 (74)	0.331
Extended	10 (03)	66 (22)	76 (25)	
Marital Status				
Single/ widow /divorcee	11 (04)	60 (20)	71 (24)	0.412
Married living with spouse	27 (09)	202 (67)	229 (76)	
Per Capita Income (Rs)				
<500	07 (03)	31 (10)	38 (13)	0.507
500-1245	11 (04)	69 (23)	80 (27)	
1246-2489	10 (03)	51 (17)	61 (20)	
2490-4149	05 (02)	65 (21)	70 (23)	
4150-8299	04 (02)	37 (12)	41 (14)	
>8300	01 (0.3)	09 (2.7)	10 (03)	

Table 2: Risk Factors associated with Drug Noncompliance in Hypertensive Patients

Risk Factors	OR(95% CI)	aOR(95% CI)
Age in years		
>60	1.415(0.48-4.13)	1.99(0.41-9.69)
50-59	2.58(0.72-9.27)	2.96(0.55-16.08)
40-49	1.59(0.41-6.13)	2.96(0.23-7.56)
30-39	1	1
Males	2.444(1.22-4.90)*	4.52(1.51-13.51)*
Religion		
Hindu	0.30(0.03-3.38)	0.13(0.01-1.68)
Muslim	0.10(0.01-2.41)	0.05(0.00-2.51)
Christians	1	1
Lower Caste	0.86(0.38-1.91)	1.28(0.46-3.53)
Illiterates	1.27(0.62-2.62)	0.81(0.29-2.25)
Occupation		
Dependents	0.15(0.03-0.75)*	0.09(0.01-0.98)
Unskilled	0.12(0.03-0.53)*	1.91(0.46-7.92)
Skilled	0.14(0.03-0.66)*	1.68(0.48-5.95)
Professional	1	1
Single@	1.37(0.64-2.93)	2.70(0.94-7.80)
Per Capita income in Rs		
<500	2.03 (0.22-18.76)	5.37(0.30-94.71)
500-1245	1.43(0.16-12.46)	1.43(0.28-7.38)
1246-2489	1.76(0.20-15.52)	1.37(0.35-5.39)
2490-4149	0.69(0.07-6.62)	0.78(0.22-2.80)
4150-8299	0.97(0.10-9.79)	0.88(0.26-2.95)
>8300	1	1
Nuclear family	0.93(0.43-2.04)	0.97(0.39-2.41)
Co-morbidities	2.67(1.32-5.37)*	3.07(1.28-7.37)
Excess Salt intake	1.05(0.46-2.43)	1.63(0.58-4.62)
Alcohol intake	1.46(0.72-2.94)	0.97(0.36-2.61)
Tobacco abuse	1.62(0.78-3.41)	1.61(0.60-4.35)
Obesity	1.24(0.61-2.51)	0.86(0.36-2.04)
Lac of exercise\$	3.45(1.30-9.15)*	
Health insurance	0.73(0.32-1.67)	0.83(0.29-2.40)

OR=Unadjusted Odds Ratio; aOR=Adjusted OR; Calculations based on Univariate and Bivariate logistic regression; @Including Unmarried, Widow and Divorce; \$physical exercise

Table-2 presents the crude relationships between socio-demographic variables and noncompliance, derived from univariate and bi-variate logistic regression models. In these unadjusted analyses, there was statistically significant association between noncompliance and Gender (OR of 2.444; [95% CI],1.218-4.905); Occupation (OR of 0.146; [95% CI],0.029-0.746) for dependents; (OR of 0.122; [95% CI],0.028-0.532) for unskilled and (OR of 0.143; [95% CI],0.031-0.664) for skilled workers; Co-morbidities (OR of 2.667; [95% CI],1.324-5.375); and Physical exercise (OR of 3.453; [95% CI],1.303-9.152). Adjusted analysis showed association between noncompliance and gender only which was statistically significant. However oth-

er variables did not show any association with noncompliance.

DISCUSSION

Overall non-compliance is 13%, which was almost similar (15%) in study conducted in South India by R.Susan⁹. Similar non-compliance rates have been reported in studies from developed countries, such as Singapore and Switzerland.¹⁰ Increased non-compliance was seen in the age group of >60yrs, which is similar to study conducted by Norman S.A¹¹ in USA. After controlling for other demographic variables in this study, male patients were found to be four and a half times more non-compliant than female patients. This is consistent with another study on patients' adherence to hypertensive medication by Schoberberger in 2002: it found that the incidence of adherence was significantly lower in male patients.¹² Literacy status and socioeconomic background were not found to be associated with treatment compliance, which was similar to study conducted by Rao CR in Southern India¹³ Socioeconomic factors, such as lack of insurance coverage, have also been related to adherence and blood pressure control.¹⁴ which was similar to this study, where in health insurance showed a protective effect. There was no significant association between the level of income and non-compliance which was similar to a study conducted in India¹⁵. Additionally, patients with co-morbidities, the association was statistical significant, which was unlike the study conducted by Susan R in south India⁹

CONCLUSION

Non -Compliance to hypertension treatment was mainly due to co-morbidities, in the current study. The reason may be the high cost of treatment or too many drugs due to co-morbidities, for not taking regular medications. Health insurance showed protective effect in this study. Hence it can be promoted for better compliance in all hypertensive patients, especially, those with co-morbidities. Hence effective intervention by promoting active patients collaboration with treatment should be directed towards rural illiterate population by primary health care providers.

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