



A study of treatment adherence and control status of diagnosed hypertensive patients in a rural community, Ludhiana

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Abstract:

Background: Hypertension is inadequately controlled in most patients due to poor treatment adherence. Not much is known about current status of treatment adherence. **Objectives:** Present study is aimed at finding the status of adherence to treatment and control status of diagnosed hypertensive patients in a rural community in Ludhiana, Punjab. **Materials and Methods:** This cross-sectional study was conducted in the rural field practice area of Community Medicine Department of Christian Medical College, Ludhiana, over a period of one year. A house to house survey of 214 diagnosed hypertensive patients was conducted. After obtaining their informed consent the participants were interviewed, using a predesigned, pretested structured questionnaire. After completing the interview, one blood pressure readings was recorded in sitting position in the right arm using an electronic BP monitoring device. Treatment adherence was assessed using the Morisky Green Scale. The data was entered and analyzed using Epidata entry and analysis. **Results:** Only 4.7 % of respondents achieved blood pressure control with treatment. Fifty three percent of respondents had low treatment adherence, according to Morisky Green Scale. **Conclusion:** The rural population of Ludhiana has a large number of hypertensive patients, most of whom have low treatment adherence. This necessitates appropriate strategies to improve treatment adherence and blood pressure control.

Key words: Adherence, Control, Hypertension

Introduction:

Hypertension is one of the main causes of cardiovascular morbidity and mortality. It is called the ‘silent killer’ because it often has no warning signs or symptoms at earlier stages and many people do not realise that they have it.

Rural and Urban Differences

Hypertension is prevalent more in urban than in rural areas [1]. Lower prevalence of risk factors for causing hypertension is seen in majority of the population of rural areas. A meta-analysis conducted with eight studies gave a pooled prevalence rate of 164.18 per thousand in urban 157.44 per thousand in rural areas [2]. A pooled epidemiological study showed that hypertension is present in 25% urban and 10% rural respondents in India [3].

Status of adherence to hypertension treatment in India

Adherence is defined as “the extent to which a person’s behaviour coincides with medical or health advice”. It involves, not only taking the prescribed medications, but also compliance with follow up appointments and maintaining the suggested lifestyle modifications [4]. The adherence

rate is worse in chronic conditions in comparison to acute conditions and decreases very abruptly after 6 months of treatment in chronic conditions [5].

Hypertension is inadequately controlled in most patients mainly due to poor adherence to treatment and not much is known about the underlying reasons for poor treatment adherence. Even though many medications are available for the treatment of hypertension but it still remains poorly controlled in both industrialized and developing countries.

Poor treatment adherence to the prescribed drugs poses a major problem among patients with hypertension, heart disease and other chronic diseases. A study conducted in Bangalore, India in 2010 on barriers preventing adherence to treatment for hypertensive patients showed that about 50% of hypertensive patients were non-adherent to their medication requirements [6].

Material and Methods

Study setting: Rural field practice area of Community Medicine Department.

Villages - Lalton Khurd, Dolon and Daad, in District Ludhiana, Punjab

Study Design: Cross Sectional Study

Study subjects: All hypertensive patients above 18 years of age, residing in the villages of Lalton Khurd, Dolon and Daad (District Ludhiana), Punjab

Sample size: Assumptions: Precision = 6.00 % Prevalence = 30.00 %. Population size = 3000 (above 18 years). Estimated sample size was 209. Two hundred and fourteen hypertensive patients were included in the study.

Methodology: The above mentioned villages come under the field practice of the department of community medicine CMC Ludhiana. The department maintains a register of diagnosed hypertension patients in the population. A house to house survey of diagnosed hypertensive patients was conducted. After obtaining their informed consent the participants were interviewed, using a predesigned, pretested structured questionnaire. After the interview, one blood pressure readings was recorded in sitting position in the right arm using an electronic BP monitoring device. The anthropometric data like height, weight, BMI, Waist Circumference, Hip Circumference and Waist Hip ratio were also recorded. Treatment adherence was assessed according to Morisky Green scale [7].

Statistical analyses

The data was entered using Epidata entry (3.1) and analyzed by Epidata analysis 2.2.2 and Windows version of Epi Info 7.14 software. Percentages were calculated for various parameters relating to healthcare seeking behavior, treatment adherence and control status. Chi-square test was applied to determine statistical significance. Logistic regression was applied to determine the factors responsible for the low treatment adherence.

Results

Table 1: Age Gender distribution of Respondents

Age Group	Male	Female	Total
30 to < 40 years	5 (17.9)	23(82.1)	28(100.0)
40 to < 50 years	6 (24.0)	19(76.0)	25(100.0)
50 to < 60 years	20 (30.3)	46(69.7)	66(100.0)
60 yrs and above	39 (41.1)	56(58.9)	95(100.0)
Total	70 (32.7)	144(67.3)	214(100.0)

Table 1 show the gender and age distribution of the respondents. It is seen here that more female respondents were enrolled as compared to males. This is due to females staying back home while the male members had gone to work at the time when the questionnaire was administered. Most of the respondents were over 60 years for both females and males genders.

Table 2: Classification of Hypertensive patients according to current blood pressure status (JNC 7 criteria)

	Number
Normal	10(4.7)
Pre-hypertensive	45(21.0)
Stage1	91(42.5)
Stage2	68(31.8)
Total	214(100)

Table 2 shows that only 4.7 percent of patients had achieved normal blood pressure. Hence regular follow-up after starting anti-hypertensive medications is needed, as only starting the treatment does not necessary lead to control of hypertension.

Table 3: Morisky Green scale interpretation

	Number
High Adherence	102(47.6)
Low adherence	112(53.3)
Total	214(100)

Table 3 clearly indicates that more emphasis should be laid by the treating physician to educate the patient and their family about the need for better drug adherence to prevent long term complications of hypertension.

Table 4: Number of respondents in each age group and their current blood pressure status

Age Group	Normal	Hypertensive	Total
30 to <40 years	1(14.3)	27(13.0)	28(13.1)
40 to <50 years	1(14.3)	24(11.6)	25(11.7)
50 to <60 years	2(28.6)	64(30.9)	66(30.8)
>60 years	3(42.9)	92(44.4)	95(44.4)
Total	7(100)	207(100)	214(100)

Table 4. It is seen here that only 7 patients in total have achieved BP control in the group. The patients, who had not achieved control, 44 percent were above 60 years of age. These patients should be focused on

by the treating physicians to achieve better adherence to treatment and better blood pressure control.

Table 5: Regression analysis of various variables with treatment adherence

Variables	Regression coefficient	Adjusted odds ratio	95% Confidence interval	P value
Age of respondents				
30-39 years	Referent			
40-49 years	-0.15	0.86	0.21 - 3.52	0.83
50-59 years	0.83	2.29	0.34 - 15.26	0.39
60-99 years	0.14	1.16	0.14 - 9.19	0.89
Age at diagnosis				
20-39 years	Referent			
40-49 years	0.24	1.27	0.27-5.93	0.76
50-59 years	-0.06	0.95	0.17-5.38	0.95
60-69 years	0.18	1.91	0.17-8.56	0.86
≥70 years	1.07	2.91	0.22-39.12	0.42
Gender				
Male	0.415	1.51	0.73-3.16	0.27
Female	Referent			
Socio economic status				
Grade II	-1.182	0.31	0.04-2.08	0.23
Grade III	-1.413	0.24	0.04-1.46	0.12
Grade IV	Referent			
Marital Status				
Married	-0.390	0.68	0.19-2.39	0.54
Unmarried	Referent			
Doctor's Qualification				
Qualified	Referent			
Unqualified	1.051	2.86	1.41-5.81	0.004
Number of doctors visited				
One	Referent			
Two	0.05	1.05	0.47-2.34	0.91
More than two	0.56	1.74	0.73-4.14	0.21
Weekly cost of medications				
Less than Rs 50/week	-0.243	0.78	0.17-3.67	0.76
More than Rs 50//week and less than Rs 100 /week	0.276	1.32	0.29-5.96	0.72
More than Rs 100/week	Referent			
Patients Satisfaction Scale				
Very dissatisfied	-21.111	0.000	0.00	1.00
Dissatisfied	-20.549	0.00		1.00
Satisfied	Referent			
Body Mass Index				
Normal	Referent			
Overweight	-0.52	0.59	0.16-2.18	0.43
Obese	-0.39	0.67	0.26-1.76	0.42

Of all the predictors analyzed, statistically significant association were found only qualification of current treating doctor. Hence being treated by an unqualified doctor is a risk factor (odd ratio 2.86) (C.I. 95% -1.41-5.81), and decreases treatment adherence.

Discussion

The study population included respondents above 18 years of age residing in the area. The study included 214 respondents (Table 1), with a gender distribution of 67.3% females and 32.7% males. Many working males could not be contacted on repeat visits also. Females and males were 62.7% and 37.2 % respectively in a study conducted in Malaysia by Ramli et al [8]. In a study conducted by Yuvaraj et al [9] females and males were 44.5% and 55.4% respectively. Gender distribution was 40.3% females and 59.7% males in a study conducted by Kale et al [10] in Maharashtra. In our study the largest age group comprised of respondents belonging to above 60 years of age (44.4%) and lowest number of respondents were between 40 to 50 years old (11.8%).

In a study conducted by Mandal et al [11] 30.4% subjects belonged to above 60 years and 51.2% subjects were between 40 to 50 years.

In the present study it was seen that only 4.7 % of respondents had achieved normal blood pressure (Table 2) at the time of the study. Majority of the respondents (42.5 %) were still in Stage 1 hypertension according to JNC 7 criteria. As seen here that proper follow-up after starting anti-hypertensive medications is needed, as only starting the treatment doesn't necessarily lead to control of hypertension. Regular follow-up on part of the patients is needed to achieve a better control of hypertension and prevent complications.

About 53.3 % of respondents have low adherence to anti hypertensive treatment (Table 3). More emphasis should be laid by the treating physician to educate the patient and their family about the need for better drug adherence to prevent long term complications of hypertension, thus helping the patients live a more productive and healthy life even with hypertension.

Logistic regression analysis (Table 5) showed that only qualification of the current treating doctor was found to be significantly associated with treatment adherence. Aggarwal et al [12] after doing a multivariable regression model concluded that participants who missed their blood pressure pills were 6.6 times more likely to have uncontrolled

hypertension. In a cohort study by Muntner P et al [13], worse adherence was associated with higher multivariable adjusted hazard ratios for each of the six stroke symptoms.

Summary

Majority of respondents belonged to age group of 60 years and above (44.4%). Only 3.3% of respondents achieved blood pressure control and most of respondents (42.5%) were in Stage 1 hypertension according to JNC 7 classification. Low treatment adherence was seen in 53.3% of respondents according to Morisky Green Scale.

Multivariate logistic regression analysis showed that as age of respondents increased the treatment adherence also increased. Male respondents had higher treatment adherence than females. Treatment adherence decreased in the lower socio economic status individuals. Married respondents had higher treatment adherence than unmarried respondents. As the number of consulting doctors increased so did the treatment adherence. As the weekly expenditure of medication increased so did the treatment adherence. Dissatisfied respondents had lower treatment adherence, and finally lower treatment adherence was seen in obese respondents. But all these factors were not found statistically significant.

Consulting a qualified doctor led to higher treatment adherence, and this factor was statistically significant on multivariate analysis.

Conclusion

The results from the study suggest that the rural population of Ludhiana has a large number of hypertensive patients, most of whom have low treatment adherence. As described above, various factors led to low treatment adherence but the statistically significant causes of low treatment adherence was the qualification of the current treating doctor. Hypertension is caused by various inter related factors, all of which need to be effectively tackled for adequate blood pressure control. This necessitates appropriate strategies to improve treatment adherence and blood pressure control. Health education, lifestyle modifications and cost effective treatment with regular follow up should be prioritized in the coming years for better control of hypertension.

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References

1. Anchala R, Kannuri NK, Pant H, Khan H, Franco OH, Di Angelantonio E, et al. Hypertension in India: a systematic review and meta-analysis of prevalence, awareness, and control of hypertension. *J Hypertens*. 2014 Jun;32(6):1170–7.
2. New Delhi: ICMR; 2004. ICMR study on Assessment of burden of Noncommunicable Diseases in India.
3. Gupta R. Trends in hypertension epidemiology in India. *J Hum Hypertens*. 2004 Feb;18(2):73–8.
4. Mili Joshi R, Khan GM. Study of drug use in essential hypertension and their compliance. *Kathmandu Univ J Sci Eng Technol*
5. Osterberg L, Blaschke T. Adherence to medication. *N Engl J Med*. 2005 Aug 4;353(5):487–97.
6. Dennis T, Meera NK, Binny K, Sekhar MS, Kishore G, Sasidharan S. Medication adherence and associated barriers in hypertension management in India. *CVD Prev Control*. 2011 Jan;6(1):9–13.
7. Morisky DE, Ang A, Krousel-Wood M, Ward HJ. Predictive Validity of A Medication Adherence Measure in an Outpatient Setting. *J Clin Hypertens Greenwich Conn*. 2008 May;10(5):348–54.
8. Ramli A, Ahmad NS, Paraidathathu T. Medication adherence among hypertensive patients of primary health clinics in Malaysia. *Patient Prefer Adherence*. 2012 Aug 31;6:613–22.
9. BY Y, MR NG, AG U. Prevalence, Awareness, Treatment, and Control of Hypertension in Rural Areas of Davanagere. *Indian J Community Med Off Publ Indian Assoc Prev Soc Med*. 2010 Jan;35(1):138–41.
10. Kale S. Compliance and Adverse drug Effects of Antihypertensives in Rural India sunil kale, ameeta patil, rh mandlecha. 2011
11. Mandal S, Saha JB, Mandal SC, Bhattacharya RN, Chakraborty M, Pal PP. Prevalence of Ischemic Heart Disease Among Urban Population of Siliguri, West Bengal. *Indian J Community Med Off Publ Indian Assoc Prev Soc Med*. 2009 Jan;34(1):19–23.
12. Aggarwal B, Mosca L. Lifestyle and psychosocial risk factors predict non-adherence to medication. *Ann Behav Med Publ Soc Behav Med*. 2010 Oct;40(2):228–33.
13. Muntner P, Halanych JH, Reynolds K, Durant R, Vupputuri S, Sung VW, et al. Low medication adherence and the incidence of stroke symptoms among individuals with hypertension: the REGARDS study. *J Clin Hypertens Greenwich Conn*. 2011 Jul;13(7):479–86.