

Original Research Article

A comparative study on the adherence to anti-hypertensive medications in urban and rural areas of Hubballi

Pratibha Rao Katapadi*, Dattatreya D. Bant

Department of Community Medicine, Karnataka Institute of Medical Sciences, Hubballi, Karnataka, India

Received: 31 January 2019

Accepted: 07 March 2019

*Correspondence:

Dr. Pratibha Rao Katapadi,

E-mail: pratibharao35@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Hypertension is a significant public health issue worldwide and can have deleterious effects on the health when it is not under control. Adherence to antihypertensive medications is thus necessary for better control of blood pressure and to reduce the risk of complications. There are various factors which support or hinder the patient's adherence to anti-hypertensive treatment. Thus this study was done to reflect the factors influencing the adherence to antihypertensive drugs among urban and rural population.

Methods: A community based cross sectional study was conducted in urban and rural field practice areas of Karnataka Institute of Medical Sciences, Hubballi. A semi-structured questionnaire was used for data collection among the known hypertensive patients. The data was entered in Microsoft Excel and analysed using SPSS software.

Results: Most of the hypertensive patients were aged 45 and above (89.5%). A total of 73.5% of the participants were adherent to antihypertensive medications and adherence was more among urban (76%) as compared to rural population (71%). Knowledge regarding complications of uncontrolled hypertension was the major factor for adherence in both the areas. The mean systolic and diastolic blood pressure was controlled in patients who were adherent.

Conclusions: There is a higher level of adherence to antihypertensive medications in urban population as compared to rural population of Hubballi. The findings suggest patient factors, clinical factors and socio-demographic factors play an important role in determining the adherence to the medication.

Keywords: Anti-hypertensive, Adherence, Urban, Rural, Comparative study

INTRODUCTION

High blood pressure is one of the major risk factor for suffering and dying as it results in premature cardiovascular events, and is the second leading cause of disability in the world.¹ Uncontrolled hypertension can cause various complications such as stroke, heart failure, cardiac failure, cognitive impairment, kidney failure and blindness, thus resulting in both social and economic burden.²

In 2008, it was estimated that 40% of the adult population had hypertension globally accounting to one billion

people, and it is estimated that 60% adults will have this condition by 2025.^{2,3} The prevalence of hypertension is not only higher in middle or low income countries but also more people are affected due to hypertension which can be attributed to lack of diagnosis, treatment and control.²

Hypertension in India is a significant health problem as it is responsible for more than half of deaths due to stroke and about 24% of coronary heart disease (CHD) deaths.⁴ The prevalence of hypertension was estimated to be 29.8% nationwide, with higher prevalence in urban areas (33.8%) when compared to rural (27.6%).⁵

Poor adherence to anti-hypertensive treatment is one of the main causes for uncontrolled blood pressure. Adherence is defined by the WHO as 'the extent to which a person's behaviour-taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider'. Proper adherence to anti-hypertensive treatment is associated with improved blood pressure control and also decreases the complications associated with it.⁶

There are several factors which contribute to the adherence of patients to antihypertensive treatment. The patient related factors include poverty, illiteracy, unemployment, lack of understanding the risk it poses on their health and life long nature of the disease. Adherence also depends on the mode of treatment provided by healthcare professionals, their relation with the patients and communication skills. Some factors are related to the drug therapy itself such as, its complexity, drug tolerance, costs and the long duration of the treatment.⁶

Thus the present study was conducted in urban and rural areas of Hubballi, to assess and compare the adherence to anti-hypertensive medications and the factors associated with non-adherence.

METHODS

This community based cross sectional study was conducted in old Hubli and Noolvi which are the urban and rural field practice areas under the department of community medicine, Karnataka Institute of Medical Sciences, Hubballi during April-May, 2018. Based on previous studies, the prevalence of adherence to anti-hypertensive drugs was found to be 61% in urban and 41% in rural areas. Thus a sample size of 200 was calculated and 100 hypertensive patients from urban and rural areas each were selected by purposive sampling method.

All the hypertensive patients aged 25 and above and who were taking anti-hypertensive drugs for a minimum 6 month duration were included in the study. The data was collected using pre-designed, pre-tested, semi-structured questionnaire by doing house to house visit. Details regarding the socio-demographic characteristics, duration of hypertension, medications taken, adherence to the medications and history of any complications of hypertension were collected from participants by interview method. A patient was said to be adherent if he/she consumed $\geq 80\%$ of the prescribed drugs in the past one month.⁶ The data collected was entered in Microsoft excel and analysed using SPSS software. Statistical tests like chi-square tests was used and a $p < 0.05$ was considered statistically significant.

RESULTS

In the present study, total of 200 known hypertensive patients were interviewed. In urban area, 86% of the

individuals were aged 45 and above and in rural they constituted 93% of the participants. Majority of the participants in both the areas were females (76.5%) and married (80.5%). Among the participants, only 43.5% were literates with the number of literates being more in urban area (56%) as compared to rural (31%). Around 70% participants in urban area were unemployed as compared to 52% in rural area. 43% participants belonged to joint family and 46.7% belonged to class V socio economic class according to modified BG Prasad classification. Majority of the participants in urban area travelled less than half an hour for the nearest medical health facility (97%) as compared to only 36% in rural area (Table 1).

In the present study, the adherence was seen among 76% hypertensive patients from the urban area and 71% from the rural area. The adherence was seen more among patients aged more than 55 years in both the areas. Similarly adherence to medications was seen more among females and those who were married. The adherence was seen more among literates in urban area (57.9%), while in rural it was reported more among the illiterates (73.2%). In urban area, people travelling for less than an hour to nearest health facility (97.4%) were more adherent to treatment, while in rural areas those who travelled for more than half an hour (59.2%) were seen to be adherent (Table 2).

The Table 3 shows that in both urban and rural areas, adherence was seen more among those who had hypertension for less than 5 years as compared to those who had the condition for more than 10 years. Patients with a lesser duration of treatment and family history of hypertension were more likely to be adherent in both the areas. In rural, people who had suffered from any complication from hypertension were more likely to be adherent (85.9%) as compared to those in urban (69.7%).

The Table 4 reveals that among the participants who were adherent to anti-hypertensive drugs, the most common factor enabling the adherence in both the areas was the knowledge that medications prevent further complications. Encouragement from health workers and family members was a motivation for adherence among 66.7% and 77.8% respectively among urban patients as compared to only 33% and 22% in rural patients. Free of cost medication was an important motivating factor that was seen more in rural patients (58.3%).

In Table 5, it is seen that in both urban and rural areas, the most common cause for non-adherence to treatment was forgetfulness, followed by thinking that blood pressure is under control. The fear of side effects and addiction to medication was a factor for non-adherence seen more among rural population.

The mean systolic and diastolic blood pressure was lower among the individuals who were adherent to anti-hypertensive drugs as compared to those who were not (Table 6).

Table 1: Socio-demographic characteristics of the participants (n=200).

Variables	Urban (n=100)	Rural (n=100)	Total (%)	Chi square test
Age category (years)				
25-35	5	0	5 (2.5)	$\chi^2=3.67$ P=0.158 Not significant
35-45	9	7	16 (8)	
45-55	17	13	30 (15)	
≥55	69	80	149 (74.5)	
Gender				
Male	26	21	47 (23.5)	$\chi^2=0.695$ P=0.404
Female	74	79	153 (76.5)	Not significant
Marital status				
Married	87	74	161 (80.5)	$\chi^2=5.38$ P=0.02 Significant
Separated	2	3	5 (2.5)	
Widowed/ Single	11	23	34 (17)	
Literacy				
Literate	56	31	87 (43.5)	$\chi^2=12.7149$ P=0.000363 Significant
Illiterate	44	69	113 (56.5)	
Occupation				
Unemployed	70	52	122 (61)	$\chi^2=6.8$ P=0.009 Significant
Farmer	0	35	35 (17.5)	
Daily Wage Worker	16	9	25 (12.5)	
Business	8	4	12 (6)	
Professional	6	0	6 (3)	
Family Type				
Nuclear	33	25	58 (29)	$\chi^2=5.6273$ P=0.059 Not significant
Joint	46	39	85 (42.5)	
Three generation	21	36	57 (28.5)	
Socioeconomic status				
Class 2	8	6	14 (7)	$\chi^2=0.4$ P=0.94 Not significant
Class 3	8	9	17 (8.5)	
Class 4	38	37	75 (37.5)	
Class 5	46	48	94 (47)	
Distance from health care (in hours)				
<0.5	97	36	133 (66.5)	$\chi^2=83.5148$ P<0.0001 Significant
>0.5	3	64	67 (33.5)	

Table 2: Socio-demographic characteristics of hypertensive patients based on the adherence to medications (n=147).

Variables	Adherent to anti-hypertensive drugs		Total (%)	Chi square test
	Urban (n=76) (%)	Rural (n=71) (%)		
Age category (in years)				
25-35	2 (2.6)	0	2 (1.4)	$\chi^2=1.64$ P=0.44 Not significant
35-45	8 (10.5)	6 (8.5)	14 (9.5)	
45-55	13 (17.1)	9 (12.7)	22 (15)	
≥55	53 (69.7)	56 (78.9)	109 (74.1)	
Gender				
Male	16 (21.1)	16 (22.5)	32 (21.8)	$\chi^2=0.04$ P=0.82 Not significant
Female	60 (78.9)	55 (77.5)	115 (78.2)	
Marital status				
Married	67 (88.2)	53 (74.6)	120 (81.6)	$\chi^2=4.468$ P=0.03 Significant
Separated	1 (1.3)	3 (4.2)	4 (2.7)	
Widowed	8 (10.5)	15 (21.1)	23 (15.6)	

Continued

Variables	Adherent to anti-hypertensive drugs		Total (%)	Chi square test
	Urban (n=76) (%)	Rural (n=71) (%)		
Literacy				$\chi^2=14.52$
Literate	44 (57.9)	19 (26.8)	63 (42.9)	P<0.001
Illiterate	32 (42.1)	52 (73.2)	84 (57.1)	Significant
Socioeconomic status				$\chi^2=0.297$
Class 2	6 (7.9)	6 (8.5)	12 (8.2)	P=0.96
Class 3	7 (9.2)	5 (7)	12 (8.2)	Not significant
Class 4	28 (36.8)	28 (39.4)	56 (38.1)	
Class 5	35 (46.1)	32 (45.1)	67 (45.6)	
Distance from health care (in hours)				$\chi^2=55.9$
<0.5	74 (97.4)	29 (40.8)	103 (70.1)	P<0.0001
>0.5	2 (2.6)	42 (59.2)	44 (29.9)	Significant
Total	76 (51.7)	71 (48.3)	147	

Table 3: Association of adherence to medications with factors related to hypertension (n=147).

Variables	Adherent to anti-hypertensive drugs		Total (%)	Chi square test
	Urban (n=76) (%)	Rural (n=71) (%)		
Duration of hypertension (in years)				$\chi^2=5.96$
<5	32 (42.1)	43 (60.6)	75 (51)	P=0.05
5-10	23 (30.3)	18 (25.4)	41 (27.9)	Not significant
≥10	21 (27.6)	10 (14.1)	31 (21.1)	
Duration of treatment (in years)				$\chi^2=6.8$
<5	32 (42.1)	45 (63.4)	77 (52.4)	P=0.03
5-10	25 (32.9)	16 (22.5)	41 (27.9)	Significant
≥10	19 (25)	10 (14.1)	29 (19.7)	
Family history				$\chi^2=3.58$
Yes	28 (36.8)	16 (22.5)	44 (29.9)	P=0.05
No	48 (63.2)	55 (77.5)	103 (70.1)	Not significant
Other chronic illness				$\chi^2=0.163$
Yes	36 (47.4)	36 (50.7)	72 (49)	P=0.68
No	40 (52.6)	35 (49.3)	75 (51)	Not significant
H/o past complications				$\chi^2=5.51$
Yes	53 (69.7)	61 (85.9)	114 (77.6)	P=0.018
No	23 (30.3)	10 (14.1)	33 (22.4)	Significant
Total	76 (51.7)	71 (48.3)	147 (100)	

Table 4: Factors enabling the adherence among study subjects (n=147).

Factors	Urban (n=76) (%)	Rural (n=71) (%)	Total	Chi-square test
Knowledge regarding complications	49 (47.6)	54 (52.4)	103 (70.1)	$\chi^2=2.3481$ p=0.125 Not Significant
Relief from symptoms	39 (50)	39 (50)	78 (53.1)	$\chi^2=0.1925$ p=0.661 Not Significant
Encouragement from health care providers	12 (66.7)	6 (33.3)	18 (12.2)	$\chi^2=1.8398$ p=0.1749 Not Significant
Support from family members	7 (77.8)	2 (22.2)	9 (6.1)	$\chi^2=1.61$ p=0.203 Not Significant
Free of cost medication	5 (41.7)	7 (58.3)	12 (8.2)	$\chi^2=0.5268$ p=0.467 Not Significant

Table 5: Factors responsible for non-adherence to treatment (n=53).

Causes of non-adherence	Urban (n=24) (%)	Rural (n=29) (%)	Total	Chi-square*
Forgetfulness	10 (41.7)	14 (58.3)	24 (45.3)	$\chi^2 = 0.2315$ p=0.63 Not Significant
High cost of medication	3 (50)	3 (50)	6 (11.3)	$\chi^2 = 0.035$ p=0.85 Not Significant
Dissatisfaction from treatment	2 (66.7)	1 (33.3)	3 (5.7)	$\chi^2 = 0.0286$ p=0.86 Not Significant
Fear of side effects	2 (28.6)	5 (71.4)	7 (13.2)	$\chi^2 = 0.298$ p=0.585 Not Significant
Fear of addiction to medication	3 (37.5)	5 (62.5)	8 (15.1)	$\chi^2 = 0.0089$ p=0.924 Not Significant
Hypertension is under control	6 (33.3)	12 (66.7)	18 (33.9)	$\chi^2 = 1.5709$ p=0.21 Not Significant

*Chi square Yates correction is used when the cell count is less than 5.

Table 6: Mean systolic and diastolic blood pressure among adherent and non-adherent subjects.

Blood pressure	Adherent (n=147)	Non-adherent (n=53)	t-test
Systolic	139.13±16.24	142.57±19.85	1.243 P=0.216
Diastolic	81.44±11.08	83.58±8.34	1.282 P=0.201

DISCUSSION

The adherence to antihypertensive treatment in the present study was 73.5%. The adherence rate in urban population (76%) was more as compared to rural (71%). Many studies done in urban areas showed a higher prevalence of treatment adherence like Bhandari et al, in urban slums of Kolkata, Tabassum et al, in urban slums of Hyderabad and Sekhar et al, in Eluru where the adherence to anti-hypertensive drugs was 73%, 61.7% and 74.2% respectively.⁷⁻⁹ While some of the studies in rural areas like Mathew et al, in Kerala and Ranjan R et al, in Uttar Pradesh have reported a higher prevalence of treatment adherence 74.1% and 87.5% respectively which is similar to present study, there are studies done by Misra et al, in Haryana, Sahoo et al, in West Bengal have reported a lower prevalence of treatment adherence of 27.4% and 44.63% respectively.¹⁰⁻¹³

In the present study, males in rural areas and females in urban areas were more adherent to the medications. The distance from the health care facility greatly influenced the adherence to treatment in urban areas where 97.4% of patients who travelled less than 0.5 hour for buying medications were adherent, whereas in rural areas, around 59.2 % of hypertensive patients who travelled for more than 0.5 hours for medications were adherent. Similar findings were reported in a study by Ambaw et al, where

only 39 (25.82%) individuals who travelled for less than 0.5 hours were non adherent as compared to 97 (41.63%) who had to travel for more than 0.5 hours.¹⁴ Among the factors enabling the adherence, encouragement from health care providers and motivation from the family members were mainly seen in urban patients, while the knowledge regarding the complications of hypertension and free of cost medications was the main motivating factors seen among the rural patients. In a study by Nithin Kumar et al, it was reported that absence of side effects, availability of free drugs and regular checkup of blood pressure, were the significant enabling factor for adherence while Mallya SD et al, reported family history of hypertension was a significant factor for adherence.^{15,16} In the present study the main causes of non-adherence was forgetfulness in both the regions similar to a study by Mallya et al.¹⁶

CONCLUSION

The present study concludes that there is a high adherence rate to anti-hypertensive drugs both in urban and rural population. The study suggests that several socio-demographic factors and patient factors play role in treatment adherence in both the areas. The results suggest that a good motivation from health care providers can increase the adherence level among hypertensive patients. Further motivation could also be provided by the patients

self-help groups where they can discuss their reasons for non-adherence and solve it.

ACKNOWLEDGEMENTS

The authors would like to thank the third year MBBS students-Abhishek M Nandur Abinaya, Adinath, Adithya, Adnan Rafiq, Aishwarya Bagi, Aishwarya Sindhur and Ajay N. for their help during data collection. The authors would also like to thank all the participants of the study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

- World Hypertension Day 2017: Know your numbers. PAHO. Available at: https://www.paho.org/hq/index.php?option=com_content&view=article&id=13257:dia-mundial-de-la-hipertension-2017-conoce-tus-numeros&Itemid=42345&lang=en. Accessed on 1 January 2019.
- World Health Organization. World Health Day 2013. A global brief on Hypertension, Silent killer, global public health crisis. Available at: https://apps.who.int/iris/bitstream/handle/10665/79059/WHO_DCO_WHD_2013.2_eng.pdf;jsessionid=4A6A225163C02DB7429B0570B7571083?sequence=1. Accessed on 1 January 2019.
- Misra P, Salve HR, Srivastava R, Kant S, Krishnan A. Adherence to treatment among hypertensive individuals in a rural population of North India. Indian J Comm Health. 2017;29(2):176-81.
- Gupta R. Trends in hypertension epidemiology in India. J Hum Hypertens. 2004;18(2):73-8.
- 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;32(6):1170-7.
- Adherence to long-term therapies. Evidence for Action. World Health Organization, 2003.
- Bhandari S, Sarma PS, Kavumpurathu R. Adherence to Antihypertensive Treatment and Its Determinants Among Urban Slum Dwellers in Kolkata, India. Asian Pacific J Public Health. 2015;27(2):74-84.
- Tabassum N, Rao RLL. A study on adherence to therapy among hypertensives in urban slums of Hyderabad. Int J Health Sci Res. 2017;7(12):180-6.
- Sekhar KC, Sharma EMS, Rao KUM, Chaitanya K, Reddy BVHR, Deotale PG. A Study On Anti-Hypertensive Drug Compliance Among Hypertensive Individuals At Ashok Nagar Urban Area Of Eluru, Andhra Pradesh. J Comprehensive Health. 2016;4(1):41-8.
- Mathew J, Krishnamoorthy S, Chacko L, Philip JH, Jacob JE, Jose JA, et al. Non Compliance to Anti-Hypertensive Medications and Associated Factors-Community Based Cross Sectional Study from Kerala. Sch J App Med Sci. 2016;4(6):1956-9.
- Ranjan R, Shukla M, Ahmad S. Non Compliance to Anti-Hypertensive Medications and Associated Factors in a rural population of Barabanki District, Uttar Pradesh: A Cross-sectional study. Sch J App Med Sci. 2016;4(12):4291-4.
- Misra P, Salve HR, Srivastava R, Kant S, Krishnan A. Adherence to treatment among hypertensive individuals in a rural population of North India. Indian J Comm Health. 2017;29(2):176-81.
- Sahoo SK, Preeti PS, Biswas D. Adherence to Anti-Hypertensive Drugs: A Clinic Based Study among Geriatric Hypertensive Patients in Rural, India. Natl J Community Med. 2018;9(4):250-4.
- Ambaw AD, Alemie GA, Yohannes, Mengesha ZB. Adherence to antihypertensive treatment and associated factors among patients on follow up at University of Gondar Hospital, Northwest Ethiopia. BMC Public Health. 2012;12:282.
- Kumar N, Unnikrishnan B, Thapar R, Mithra P, Kulkarni V, Holla R, et al. Factors associated with adherence to antihypertensive treatment among patients attending a tertiary care hospital in Mangalore, South India. Int J Cur Res Rev. 2014;6(10):77-85.
- Mallya SD, Kumar A, Kamath A, Shetty A, Reddy SKT, Mishra S. Assessment of treatment adherence among hypertensive patients in a coastal area of Karnataka, India. Int J Community Med Public Health. 2016;3:1998-2003.

Cite this article as: Katapadi PR, Bant DD. A comparative study on the adherence to anti-hypertensive medications in urban and rural areas of Hubballi. Int J Community Med Public Health 2019;6:1701-6.