

Adherence to Treatment of Hypertension: A Comparison amongst Patients Registered in Health Facilities in Rural and Urban Areas of A District in Rajasthan

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Received: 30-03-2023 / Revised: 21-04-2023 / Accepted: 25-05-2023

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Conflict of interest: Nil

Abstract:

Background: India is facing an increase in cases of non-communicable diseases (NCDs) in general and hypertension in particular. Uncontrolled hypertension is caused by non-adherence with antihypertensive treatment. Although few studies have been conducted in different parts of the country to demonstrate adherence in hypertensive patients, little has been documented in Rajasthan on the matter.

Aim: To assess the adherence to treatment of hypertension among patients registered in government health facilities in rural and urban areas of Churu district in Rajasthan.

Method: In this cross-sectional study, a list of all districts of Rajasthan was procured. One district (Churu) was chosen by random sampling method. The study area included all rural and urban government health facilities in the selected district. All hypertensive patients registered at these rural and urban health facilities between January 2021 and December 2021 who consented to the study were included in the study. Using a pre-designed and tested questionnaire, demographic characteristics, enrollment details, and clinical characteristics were collected through face-to-face interviews, and their personal medical records were reviewed to confirm treatment.

Result: The study was carried out on 5160 hypertensive patients. Adherence with antihypertensive treatment was 50.74%. 52.43% of males followed treatment adherence within 3 months of follow up period versus 49.08% of females. 56.03% of hypertension patients in rural areas adhered to the treatment, compared to 40.81% in urban areas. Patients older than 60 years were more compliant (54.45%) than patients \leq 60 years (46.22%).

Conclusion: Gender, place of residence, and age were found to be statistically significant factors in determining community adherence to medical recommendations for treating hypertension. Compared to their counterparts, treated patients show a significant improvement in blood pressure control.

Keywords: Adherence, Hypertension, comparison, Antihypertensive treatment.

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Introduction

India is seeing an increasing number of cases of non-communicable diseases (NCDs) in general and hypertension in particular. Cardiovascular diseases (CVD), which include heart attacks and strokes, are the leading cause of death and morbidity worldwide, accounting for about a third of all deaths in India. While cardiovascular disease deaths are declining in developed countries, they are increasing in low- and middle-income countries (LMICs). Uncontrolled blood pressure is one of major risk factors for cardiovascular diseases and is estimated to be responsible for over 10 million deaths each year, more than all infectious diseases combined. High blood pressure contributes about 1.6 million deaths per year in India from ischemic heart disease and stroke [1] [2]. Deaths from

hypertension are largely preventable. Compared to other evidence-based NCD interventions, controlling hypertension has the greatest potential to save lives. It has been observed that adherence to AHT (hypertensive medication) reduces the risk of stroke and ischemic heart disease by approximately 34% and 21%, respectively [3]. Non-compliance with long-term therapy significantly reduces the effectiveness of treatment, making it a critical health problem for the community, both from a quality-of-life perspective and from a health economics perspective. Patients who understand their medication regimens help improve their adherence to therapy, thereby can prevent the debilitating complications of hypertension [4][5].

To achieve a 25% relative reduction in the incidence of hypertension by 2025, according to the Government of India's National Action Plan, approximately 4.5 million more people with hypertension will need effective antihypertensive treatment. The National Program for the Prevention and Control of Cancer, Diabetes, Cardiovascular Disease and Stroke (NPCDCS) was established in 2010 to address the growing burden of non-communicable diseases in India. This is a Population based Screening Program (PBS) and has been recently renamed as National Programme for Prevention & Control of non-Communicable diseases (NP-NCD) amid its widening coverage and expansion.

The India Hypertension Control Initiative (IHCI), a multi-partner initiative, complemented this screening program by strengthening primary care hypertension management. The IHCI was launched in November 2017.

The main objective of this initiative is to develop the skills of primary care health professionals to manage hypertension according to a standard treatment protocol specific to the condition and using a patient-centred approach. It provides continuity in the care of people diagnosed with hypertension during screening through treatment, follow-up and documentation. It aims to accelerate progress towards the Government of India's NCD target by integrating and improving evidence-based strategies to strengthen the building blocks of hypertension management and control.

Need For the Study

According to the WHO, adherence to therapy in people with chronic diseases is 50%. Even non-medical measures, such as lifestyle changes or skipping prescribed medications, can be associated with uncontrolled high blood pressure and the risk of complications. Although few studies have been conducted in different parts of the country to demonstrate compliance in hypertensive patients, little has been documented in Rajasthan on the matter. This study aims to assess the treatment adherence of hypertensive patients enrolled in rural and urban government health facilities in a selected district of Rajasthan. This, in turn, would help assess the status and effectiveness of the ongoing NCD program and analyze the underlying realities pertaining to patient treatment outcomes.

Aim and Objectives

Aim: To assess the adherence to treatment for hypertension among study population.

Objectives

1. To assess the adherence to treatment among hypertensive population.
2. Identifying the factor(s) associated with non-adherence to treatment among the subjects.

3. To examine the outcome (in term of BP changes) in relation to adherence to anti-hypertensive treatment.

Methods and Materials

There are about 33 districts in Rajasthan. One district was selected by random sampling method. The study area included all rural and urban government health facilities in the selected district. The study recruited hypertensive patients enrolled in health care facilities in the study area from January 2021 to December 2021 and those who met the inclusion criteria. The research sample for this descriptive cross-sectional study consisted of 5,160 individuals. However, the adequacy of the sample size was checked. Taking into account the WHO data on the prevalence of adherence to therapy in chronic diseases at the 50% level, with a confidence interval of 95% and an allowable error of 2%, the sample size after considering the confounders.

A pre-designed and pretested questionnaire was used to collect data during face-to-face interviews with participants between September 2022 and May 2023. The interview locations were selected health care centers across the study area. All participants were asked to provide written informed consent after being informed of the study objectives and procedures and before formally beginning the interviews. Patients' medical records were reviewed to confirm treatment details. Data included.

1. Demographic characteristics such as demographics, place of residence, education, occupation, etc.
2. Clinical features such as blood pressure measurements at recommended follow-up times and recommended treatment.
3. Enrolment dates, including date and quarter of enrolment, preferred health facilities for enrolment.

Due to the lack of a standard definition of adherence, the following three blood pressure measurements at the recommended follow-up visits were considered compliant with treatment and otherwise if inconsistent. The study used the standard operational definition of hypertension. Hypertension is defined as systolic blood pressure (SBP) ≥ 140 mmHg and/or diastolic blood pressure (DBP) ≥ 90 mmHg.

Inclusion Criteria:

1. Patients diagnosed with hypertension with systolic blood pressure ≥ 140 mmHg at the time of registration at government health facilities and who belong to the age group ≥ 30 years.
2. Patients who gave written informed consent to the study.

Exclusion criteria:

1. Patients who are seriously ill and not able to give interview.
2. Hospitalized patients.

Ethical Considerations:

Ethical clearance was obtained from the Institutional Ethics Committee (IEC), before undertaking the present study.

Statistical Analysis: Data was entered in Microsoft Office Excel spreadsheet and appropriate tests were applied to find significant association and p value <0.05 was considered statistically significant.

Results

Of all registered hypertensive patients, 5501 met the inclusion criteria for this study. However, of these hypertensive subjects, 5160 consented to the study and were included in the study.

Table 1: Distribution of study population age, gender and health facility of registration

Gender		Male	Female	Total
Age	30 – 40	126 (4.94%)	224 (8.58%)	350 (6.78%)
	41 – 50	298 (11.69%)	444 (17.01%)	742 (14.38%)
	51 – 60	599 (23.49%)	635 (24.33%)	1234 (23.91%)
	61 – 70	1022 (40.08%)	876 (33.56%)	1898 (36.78%)
	>70	505 (19.80%)	431 (16.51%)	936 (18.14%)
Health facilities	Rural	1577 (61.84%)	1787 (68.47%)	3364 (65.20%)
	Urban	973 (38.16%)	823 (31.53%)	1796 (34.80%)
Total		2550 (49.41%)	2610(50.58%)	5160 (100%)

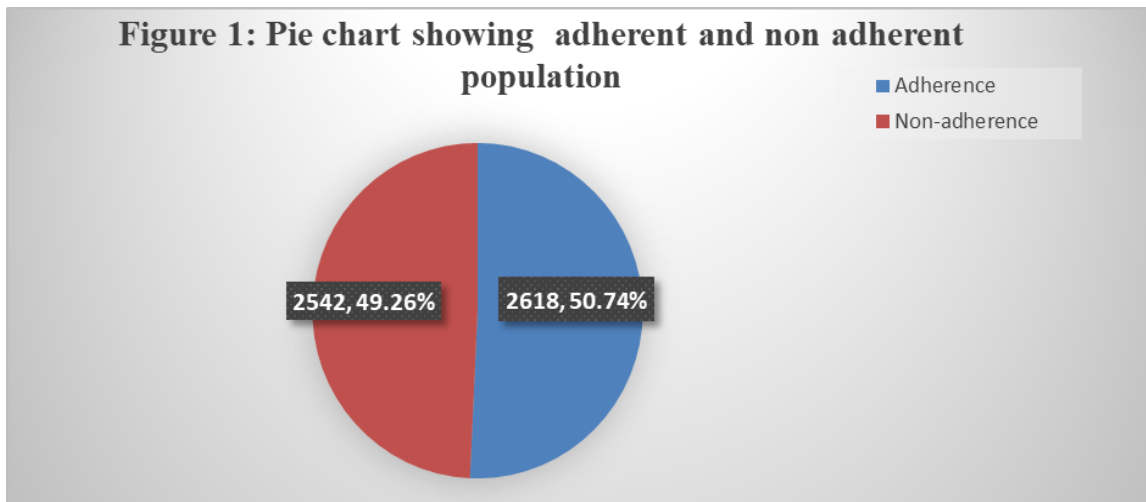


Figure 1: Pie chart showing adherent and non-adherent population

Table 2: Mean age (in years) for adherent and non-adherent group in the study population

Variable		Adherence (n=2618)	Non-adherence (n=2542)	P value
Age (in years)	Mean ± SD	59.85 ± 11.05	57.22 ± 12.02	0.0000

Table 3: Association between different variables and adherence/ non -adherence to medication

Variable		Adherence (n=2618)	Non-adherence (n=2542)	Chi Square (df)	p value
Gender	Male	1337 (52.43%)	1213 (47.57%)	5.661 (1)	p=0.017
	Female	1281 (49.08%)	1329 (50.92%)		
Health facilities	Rural	1885 (56.03%)	1479 (43.97%)	107.931 (1)	p=0.000
	Urban	733 (40.81%)	1063 (59.19%)		
Age	≤60	1075 (46.22%)	1251 (53.78%)	34.285 (1)	P=0.000
	>60	1543 (54.45%)	1291 (45.55%)		

Table 4: Distribution of mean initial and mean final BP in adherent group (n=2618)

Variable	Initial BP (mm Hg) Mean ± SD	BP during 3 rd follow up (mm Hg) Mean ± SD	P value (Paired t-test)
Systolic	150.84 ±14.53	144.94 ±18.29	P= 0.0000
Diastolic	86.83 ± 9.55	85.06 ± 9.78	P= 0.0000

Discussion

The aim of this study was to evaluate adherence to medical recommendations in the management of hypertension in patients enrolled in rural and urban government health facilities in a selected district of Rajasthan. A total of 5,160 hypertensive patients were included in the study. Selected individuals were interviewed using a pre-designed and pre-tested questionnaire and their personal medical records were reviewed.

The study found that females (50.58%) outnumbered males (49.41%). This result agreed with a previous study by Babu Rao et al. (2014) [12], who also found a higher proportion of women (59.1%). Also in the study by Alain Menanga et al. (2016) [19] the majority (59.48%) of the population surveyed were women. Regarding age, the mean age of the hypertensive subjects in this study was 58.52 ± 11.59 years. A similar study by Nazia Tabassum et al. (2017) [20] observed a mean age of 54.48 ± 11.03 years. Saman K Hashmi et al. [6] in Pakistan (2007) found in their study that the mean age is 52 ± 11 years. In terms of health facilities, rural health facilities recorded a higher number of hypertensive patients (65.20%) than urban health facilities (34.80%).

In the present study, the prevalence of adherence to antihypertensive medication was 50.74%. Similar results were reported by Dr. Dennis Thomas et al. (2011) [9] in Bangalore, where adherence to antihypertensive drugs was 50.3%. A higher compliance was found by Subhasis Bhandari (2011) [8] in Kolkata, namely 73% (95% CI 68-78%). Bhandari B et al (2015) [15] observed in a community study in Nepal that 56.5% of the population adhered to the prescribed antihypertensive treatment. A descriptive cross-sectional study by Srivastav AK (2015) [14] et al. in Dehradun showed that adherence to antihypertensive treatment was 73%. In a study by Nazia Tabassum et al. (2017) [20] the compliance was 61.70%. The lower prevalence of adherence in the present study can be attributed to the lower awareness level about the disease in the community under consideration.

Adjusting for age, 46.22% of people in the ≤ 60 years age group followed the doctor's recommendations and 54.45% in the >60 years age group. The relationship between age and medical compliance is found to be statistically significant. Babu Rao et al. (2014) [12] found in a study in the urban slums of Hyderabad that the association between age and compliance is statistically significant. Similar associations were found in a study conducted by Dr. K. Hema et al. (2014) [13] in a tertiary care hospital Guntur and Siraj Ahmed (2015) [16] in North India. Unlike our study R.C.Kumaraswami et al. (2015) [17] in South India

found that there was no significant association between age and compliance. In various other studies [10], [11], [18] no significant correlations were found. Greater adherence to medical recommendations in older people can be explained by the presence of complications and greater awareness about the disease and its progression.

Present study observed a higher adherence to medication among males (52.43%) than females (49.08%). This association between gender and adherence to medication was found statistically significant ($P=0.017$). Consistent to present study, Dr. K. Hema et al (2014) [13] in tertiary care hospital Guntur observed that gender was significantly associated with adherence. In contrast, study by Dr. Babu Rao et al (2014) [12] in urban slum of Hyderabad, observed that females (64.2%) were comparatively more compliant than males (55.4%) but this was not statistically significant. Study by Saman K. Hashmi et al (2007) [6] in Pakistan documented that association between gender and adherence to medication was not statistically significant. Similar results were obtained in various other studies done by Siraj Ahmed (2015) [16] in North India; Venkatachalam J., et al (2015), [18] Kancheepuram District, Tamil Nadu; Nithin Kumar et al (2014) [11] in Mangalore, South India. The reason could be better accessibility to health facilities and higher awareness in males.

In the presented study, 56.03% of hypertensive patients enrolled in rural health facilities were compliant to treatment, compared to 40.81% of patients in community health facilities. This was a new finding from this study, as most of the previous studies of antihypertensive medication adherence were conducted in rural or urban settings. This association was also statistically significant. A study by Srivastav AK et al. (2015) [14] conducted in a rural setting in Dehradun district showed that adherence to antihypertensive treatment was 73%. Babu Rao et al. (2014) [12] observed that 60.6% in Hyderabad urban slums were complying with prescribed antihypertensive medication. A high level of adherence (73%) was also observed in the urban slums of Kolkata (2011) [8]. The higher compliance rate in rural health facilities in this study can be attributed to the growing awareness of the rural population about the disease.

Conclusion

Adherence to therapy has been the subject of numerous studies and various interventions have been proposed to improve adherence to therapy. The present study found that adherence to antihypertensive medication was 50.74%. This adherence was significantly better in males in the older rural population. Gender played a role, with

52.43% males adhering to the treatment in 3 months follow up compared to 49.08% females. 56.03% of hypertensive patients registered at rural health facilities adhered to the treatment compared to 40.81% of patients in urban settings. Age also had an impact, patients over 60 years were more adherent to treatment (54.45%) compared to patients \leq 60 years (46.22%). There was also a statistically significant improvement in blood pressure control in patients who adhered to therapy compared to their counterpart. Overall, the findings highlight the importance of addressing various factors such as age, gender and residence to improve community adherence to hypertension treatment. Interventions that address these factors have the potential to improve adherence in hypertensive patients. A systematic approach involving coordinated efforts by health professionals, researchers, health planners, and policy makers using a standardized treatment protocol and the application of an effective adherence intervention, considering the determinants of community hypertension management adherence, health awareness and motivation can help achieve desired clinical outcomes.

Acknowledgement

The author would like to thank Dr. Shweta Mangal (study guide), Professor, Department of Community Medicine, Mahatma Gandhi Medical College & Hospital, Jaipur; Dr. Rajaat Vohra, HOD, Department of Community Medicine, Mahatma Gandhi Medical College & Hospital, Jaipur, and Dr. Harkesh Kumar and Dr. Vinay Godara (Residents, Department of Community Medicine, Mahatma Gandhi Medical College & Hospital, Jaipur) for their continued support throughout the study.

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