Section: Community Medicine

Original Research Article

HYPERTENSION MANAGEMENT IN THE ELDERLY: A COMMUNITY-BASED STUDY ON AWARENESS AND ADHERENCE IN CENTRAL INDIA

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ABSTRACT

Background: Hypertension remains a leading contributor to the growing non-communicable disease (NCD) burden among India's elderly. In 2019, its prevalence among geriatric aged ≥60 years was 63%, with nearly half remaining undiagnosed. The objective of the present study is to find out prevalence, awareness status, treatment status, adherence, and control among the geriatric hypertensive population in Raipur Division, Chhattisgarh.

Materials and Methods: A community-based cross-sectional study was conducted during February–April 2025 in Raipur Division, Chhattisgarh. Using multistage random sampling, 400 elderly individuals aged ≥60 years were included through house-to-house surveys. Data were collected using a pretested semi-structured proforma, and blood pressure was measured using a validated digital monitor.

Results: Among the 400 geriatric hypertensive participants, 63.5% were aware of their hypertensive status, while 36.5% remained undiagnosed. Among those who were aware (n = 254), 86.2% were receiving regular antihypertensive treatment. Blood pressure was adequately controlled in 71.2% of treated individuals, resulting in an overall control rate of 42.2% among all hypertensive elderly participants. Government hospitals were the most frequently used health facilities, with 55% of participants seeking care in the public sector.

Conclusion: Despite the expansion of national NCD programs, a substantial gap persists between detection and effective control of hypertension among the elderly. A large proportion remains undiagnosed, and overall blood pressure control is suboptimal. Strengthening community-based screening, early diagnosis, and sustained follow-up in primary care is essential to improve hypertension control in this population.

Keywords: Hypertension; Geriatric; Hypertension Awareness; Treatment; adherence.

INTRODUCTION

Hypertension, often referred to as the "silent killer," is one of the most prevalent non-communicable diseases (NCDs) and a major risk factor for cardiovascular morbidity and mortality worldwide. It contributes to approximately 7.5 million deaths annually, accounting for nearly 13% of all deaths globally. The Global Burden of Disease (GBD) study identified elevated systolic blood pressure as the single most significant risk factor for premature mortality and disability-adjusted life years (DALYs) lost across populations.[1]

India, the world's most populous country, has undergone a dramatic demographic transition over the past 50 years, resulting in nearly a tripling of the population aged 60 years and older (i.e., the elderly) (Government of India, 2011).

Age is an independent risk factor for hypertension, and its prevalence among older adults is significantly

higher than among younger adults.[1] Hypertension accounts for a large proportion of cardiovascular diseases (ischemic heart disease, stroke, chronic kidney disease, and dementia) in the elderly population.[2]

Given the demographic transition and rising burden of NCDs, there is an urgent need to assess the awareness, treatment adherence, and control status of hypertension among the geriatric. Understanding these parameters will provide valuable insights to strengthen NCD control programs, tailor geriatric health services, and improve adherence to lifelong antihypertensive therapy.

As hypertension is a public health problem, studies on the prevalence of hypertension and its related risk factors are important. Limited studies have been done to evaluate the socio–demographic profile, risk factors, and prevalence of hypertension among the tribal populations in India, and especially in the state of Chhattisgarh.

Aim: To assess the prevalence of hypertension awareness, treatment adherence, and control of hypertension among geriatric population in Raipur division of Chhattisgarh

Objectives:

1. To find out the prevalence of hypertension awareness using Joint National Committee (JNC) 7 classification among geriatric hypertensive population in Raipur division of Chhattisgarh
2. To know the status of treatment adherence among geriatric hypertensives
3. To find out the control status of hypertension among geriatric hypertensives

MATERIALS AND METHODS

Study Design and Setting: A community-based cross-sectional observational study conducted in the Raipur Division of Chhattisgarh

Study Duration and Population: Data collection was conducted from February 2025 to April 2025. Study population includes geriatric populations aged 60 years and above residing in the Raipur division of Chhattisgarh

Sample Size and Sampling method: The sample size of 400 was calculated using the Cochran formula ($4pq/d^2$) with a 95% confidence interval, 5% absolute precision, taken a prevalence of 50% of a previous study, and a non-response rate of 5%. In the present study, multistage sampling was used In Raipur division total 4 districts. From each district 1 block, selected by simple random sampling. From each block 5% CEB (Census enumeration block) was selected using Systematic random sampling and PPS applied. A Total of 32 CEB's selected and the map of CEB's were obtained from the Directorate of Census Operations Office, Naya Raipur, Chhattisgarh. To cover up the sample size of 400, the Probability Proportionate to Size (PPS) and Simple random sampling method were applied. Total of 544 households covered by Epi random walk in the selected CEB's.

Inclusion and Exclusion Criteria

The study population comprised hypertensive individuals (Known or identify during survey) aged 60 years and above residing in selected census enumeration blocks of the Raipur Division. Elderly individuals who were seriously ill or unwilling to participate were excluded from the study.

Data Collection and Analysis

Data were collected

1. Direct interview method using pre-tested semi-structured questionnaire,
2. Clinical Examination. The questionnaire included information on socio-demographic characteristics, lifestyle factors, health-seeking behaviour, awareness of hypertension, and treatment. Blood pressure was measured using a validated digital sphygmomanometer in accordance with standard guidelines. Hypertension was defined as systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg, or current use of antihypertensive medication. Medication adherence was assessed using the 8-item Morisky Medication Adherence Scale (MMAS-8) and classified as high, medium, or low adherence.

Data were entered into Microsoft Excel and analysed using Jamovi Statistical Software. Categorical variables were summarized using frequencies and percentages. A p-value of less than 0.05 was considered statistically significant.

RESULTS

It was observed most of the study subjects belonged to the 60–74 years age group, 307 (76.7%), with a mean age of 67.91 ± 6.88 years. Females (52.3%) were slightly more than males (47.8%). The majority were married (74.3%), while 103 (25.8%) were widowed. In terms of education, illiterate was (159; 39.8%) and with majority had primary-level education (170; 42.5%). In the occupation, nearly half of the subjects were unemployed or homemakers (195; 48.8%), followed by those engaged in clerical, shopkeeping, farming, or self-employment (152; 38.0%). By socioeconomic classification, the majority belonged to Class III (lower middle), comprising 143 (35.8%), and Class II (upper middle), 128 (32.0%). [Table 1]

The study results among 400 participants, (254) 63.5% were known of their hypertension, while (146) 36.5% were finding during survey. Of the 254 known hypertensives, (219) 86.2% were taking treatment, and (35) 13.8% were not. Among those on treatment (n=219), 54.7% (120) obtained medicines from government hospitals and 45.3% (99) from private facilities. In the non-adherent group (n=35), the main reason for irregular intake was feeling asymptomatic (18) 51.2%, followed by side effects (6) 17.2% and

lack of support or access (3) 8.5% each. The MMAS-8 assessment showed that (109) 49.8% had medium adherence, (97) 44.3% had high adherence, and (13) 5.9% had low adherence. [Table 2]

It was observed Blood pressure control status among known hypertensive (n=254) subjects by treatment status. Among those receiving treatment (n = 219), 71.3% (156) had controlled blood pressure, whereas 28.7% (63) remained uncontrolled despite therapy. In contrast, among subjects not receiving treatment (n = 35), the table shows a much lower control rate: only 37.2% (13) had controlled blood pressure, whereas the majority 62.8% (22) were classified as uncontrolled. [Table 3]

Table 1: Distribution of the study subjects according to their socio-demographic characteristics (n=400)

S. No.	Variables	Frequency (n)	Percent (%)
	a	b	c
1	Age group (years)		
	60-74	307	76.7
	75-84	84	21.1
	≥85	09	2.2
	Mean = 67.91±6.88, Median = 65, Mode = 60		
2	Sex		
	Male	191	47.8
	Female	209	52.3
3	Marital Status		
	Married	297	74.3
	Widowed	103	25.8
4	Education status		
	Illiterate	159	39.8
	Primary School	170	42.5
	Middle School	41	10.3
	High School	19	4.8
	Intermediate/ Post High School Diploma	8	2.0
	Graduate	2	5
	Postgraduate	1	.3
5	Occupation status		
	Unemployed/Homemaker	195	48.8
	Unskilled	25	6.2
	Semiskilled	4	1.0
	Skilled	17	4.3
	Clerical/ Shop owner/Farmer/Self-employed/ Small	152	38.0
	Professional	7	1.7
6	Socioeconomic status		
	I-upper	26	6.5
	II-upper middle	128	32.0
	III-lower middle	143	35.8
	IV-lower middle	101	25.3
	V-lower	2	.5

Table 2: Distribution of known hypertensive subjects according to their medications & adherence

S. No.	Variables	Frequency (n)	Percent (%)
	a	b	c
A	Awareness (n=400)		
1	Known hypertensive	254	63.5
2	Finding during survey	146	36.5
3	Total	400	100.0
B	Intake of prescribed medication (n=254)		
1	Yes	219	86.2
2	No	35	13.8
3	Total	254	100
C	Place of getting medication (n=219)		
1	Government hospital	120	54.7
2	Private hospital	99	45.3
3	Total	219	100
D	Cause of irregularity (n=35)		
1	I have no physical problem	18	51.2
2	medicine causes adverse effects	6	17.2
3	family member not supporting	3	8.5
4	no nearby place to seek care	3	8.5
5	The doctor advised stopping treatment	3	8.5
6	not able to go	1	2.9
7	addiction to medicine	1	2.9
8	Total	35	100
E	Treatment adherence status MMAS-8 Scale (n=219)		
1	< 6 (low adherence)	13	5.9
2	6 to <8 (Medium adherence)	109	49.8
3	=8 (High adherence)	97	44.3

4	Total	219	100

Table 3: Distribution of Blood Pressure Control Status among known hypertensive subjects with and without treatment (n =254)

S. N	Blood Pressure Control Status	With treatment (N=219)		Without treatment (N=35)		Total (N=254)	
		n	Percent (%)	n	Percent (%)	n	Percent (%)
		a	b	c	d	e	f
1	Controlled	156	71.3	13	37.2	169	66.5
2	Uncontrolled	63	28.7	22	62.8	85	33.5
	Total	219	100	35	100	254	100

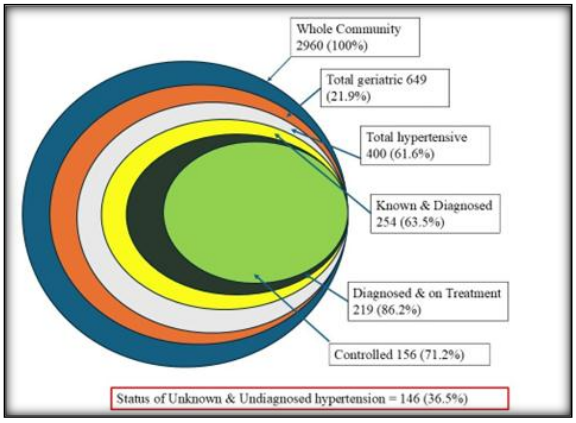

Figure 1: Showing blood pressure status of geriatric study subjects (n =400)

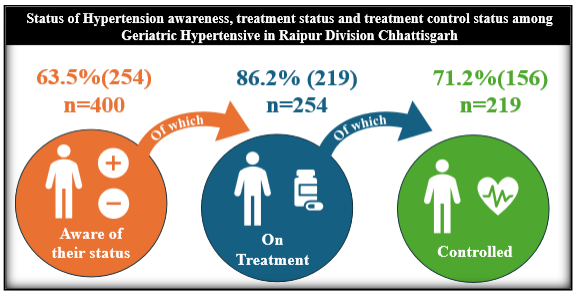

Figure 2: Showing Status of Hypertension among geriatric hypertensives (n=400)

DISCUSSION

Hypertension remains one of the most important non-communicable diseases affecting the elderly population and contributes substantially to cardiovascular morbidity and mortality. The present community-based cross-sectional study assessed awareness, treatment adherence, blood pressure control, and health-seeking behaviour among geriatric hypertensive individuals in the Raipur Division of Chhattisgarh. The study also explored factors related to treatment practices and healthcare utilization among older adults.

In the present study, most of participants belonged to the 60–74 years age group, and females constituted a slightly higher proportion than males. Most participants had low educational attainment, with a large proportion being illiterate or educated only up to the primary level. Similar sociodemographic patterns have been reported in studies conducted among elderly populations in India and other low- and middle-income countries, where hypertension is more common among older adults with limited education and financial dependence. [3-10] The predominance of lower educational status among elderly hypertensives may influence awareness, treatment adherence, and healthcare-seeking behaviour.

Awareness of hypertension in the present study was 63.5%, while 36.5% of elderly hypertensive individuals were newly detected during the survey. This finding indicates that a considerable proportion of elderly individuals were living with undiagnosed hypertension in the community. Comparable findings have been reported in studies from Kerala, Tunisia, and Bangladesh, where awareness levels ranged from moderate to suboptimal among older adults.[3,4,8] However, the awareness observed in the present study was relatively higher than that reported in certain rural and tribal settings, possibly due to expanding screening services under NPCDCS, Health and Wellness Centres, and increased community-level contact with health workers.

Among known hypertensive subjects, treatment uptake was high, with (86.2%) of participants receiving antihypertensive medication. Similar observations have been documented in studies from Kerala and urban India, where treatment rates among diagnosed elderly hypertensives were comparatively better once the disease was identified.[4,11-13] The relatively high treatment uptake in the present study may reflect improved availability of free antihypertensive medicines through government health facilities and increasing awareness regarding chronic disease management among older adults.

Government hospitals (54.7%) were major source for obtaining medicines and routine care. This finding highlights the important role of the public healthcare system in geriatric hypertension management in Chhattisgarh. Similar healthcare-seeking patterns have been observed in previous Indian studies, particularly among economically dependent elderly populations.[12] Despite good treatment uptake, irregular medication intake was still observed among a small proportion of participants. The most common reason for non-adherence was the absence of physical symptoms, followed by adverse drug effects and lack of family support. Similar reasons for discontinuation of antihypertensive therapy have been reported in earlier studies among elderly hypertensive patients.[13]

Assessment using the MMAS-8 scale demonstrated that most treated participants had medium or high

adherence, while only a small proportion exhibited low adherence. These findings are comparable with studies conducted in tertiary care and community settings in India, which reported moderate-to-good medication adherence among elderly hypertensive individuals. Better adherence in the present study may be related to regular follow-up visits, availability of medicines through public facilities, and family involvement in healthcare decisions. Blood pressure control among treated individuals was relatively satisfactory, with nearly (66.5%) achieving target control levels. In contrast, control among untreated individuals remained substantially lower. Similar trends have been observed in previous studies where treatment was strongly associated with improved blood pressure control.[1,4] These findings reinforce the importance of early diagnosis and uninterrupted treatment in preventing long-term cardiovascular complications among elderly hypertensive patients.

However, despite good control among treated subjects, the overall blood pressure control rate among all hypertensive elderly (n=400) individuals remained suboptimal (n=169) 42.2%. This was primarily due to the large proportion of undiagnosed cases identified during the survey. The findings support the concept of the "rule of halves" and the continuing "hypertension iceberg" phenomenon in the community, where many individuals remain unaware (n=146) 36.7% of their condition until actively screened. Similar concerns regarding gaps in the hypertension care cascade among older adults have been highlighted in national and international studies.

From a public health perspective, the findings emphasize the need for strengthening community-based screening activities for early identification of hypertension among older adults. Institutionalize regular BP screening for individuals aged ≥30 years through outreach and door-to-door visits, supported by line-listing of high-risk groups. In addition, develop 'Community role models' from among controlled hypertensive or motivated community members to act as local role models, promote screening uptake, support adherence, and encourage early care-seeking within their neighbourhood.

The present study has certain strengths. Being a community-based study, it provides important evidence regarding hypertension awareness and treatment practices among elderly individuals at the population level. Standardized blood pressure measurement and use of the MMAS-8 adherence scale added methodological strength to the assessment. However, the study also had some limitations. As it was cross-sectional in design, causal relationships could not be established. Information related to treatment adherence and health-seeking behaviour was based on self-reporting and may be subject to recall bias. In addition, findings may not be generalizable beyond the study area.

CONCLUSION

This study concluded that moderate hypertension awareness and high treatment uptake among the elderly, with good control among those treated, but also reveal a substantial "hidden" burden. The fact that over one- third of elderly hypertensives were undiagnosed highlights significant gaps in community screening and detection.

The study underscores that despite national initiatives (such as the NPCDCS, IHCI, and Health & Wellness Centres), blood pressure screening and control in older adults remain suboptimal. The Raipur Division survey confirms a persistent "hypertension iceberg": while treatment adherence is high once hypertension is detected, a large drop- off occurs at the diagnosis stage, with 36.5% of elderly hypertensives undetected. Only 42.2% of all hypertensive elders achieved control, far below Chhattisgarh's 70% target and national goals.

Limitations

The study was conducted only in the Raipur Division of Chhattisgarh, which may limit the generalizability of findings to other regions of India. Self-reported data regarding medication adherence and lifestyle factors may be subject to recall bias and underreporting. Additionally, the cross-sectional study design limits causal inference, as data was collected at a single timepoint and cannot establish a cause-and-effect relationship. Furthermore, single-visit blood pressure measurements may not fully capture a participant's usual blood pressure due to natural daily fluctuations. Future multi-regional and longitudinal studies are recommended to track long-term trends and assess blood pressure outcomes across diverse populations.

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