

## Original Article

# Hypertension and Factors Affecting Compliance to Antihypertensive Therapy among Elderly from Rural Area

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### ABSTRACT

**Introduction:** Hypertension is a leading non-communicable disease (NCD) and itself is a risk factor for other NCDs. Compliance plays a major role in the management of chronic illnesses like hypertension. It is desirable to know the status of hypertension among the elderly from rural areas in the current phase of demographic aging.

**Methodology:** A community-based cross-sectional study was conducted among a total of 387 elderly people from the rural field practice areas. The generic adherence assessment tool, Morisky Medication Adherence Scale (MMAS-8) was used to assess adherence/compliance to antihypertensive therapy.

**Result:** The prevalence of hypertension was 45.7% among the elderly. The present study identified 31.1% of previously undiagnosed cases of hypertension. Staying with the family was a significant factor associated with compliance.

**Conclusion:** The prevalence of hypertension and number of undiagnosed hypertensive cases is high among the elderly from the rural areas. Maintaining compliance is crucial in controlling blood pressure levels among elderly hypertensive.

**Keywords:** Compliance, Elderly, Hypertension, MMAS-8

### INTRODUCTION

Most countries around the world are facing the challenge of demographic aging. This is especially true for developing countries like India, where a comparison of the National Family Health Survey (NFHS)-III and National Family Health Survey (NFHS)-IV has indicated that the population in India aged 60 years or more has increased from 7.4% to 10% and is further expected to increase to 12.4% of the population by the year 2026.<sup>1-3</sup>

Hypertension is known to be a leading risk factor for cardiovascular disease (CVD) and mortality worldwide.<sup>4</sup> The number of individuals living with hypertension worldwide is projected to be 1.56 billion by the year 2025.<sup>5</sup> According to the seventh report of the Joint National Committee (JNC-7), the prevalence of hypertension is so that more than two-thirds of individuals after the age of 65 are hypertensive.<sup>6</sup> Compliance to treatment is the dynamic conduct of an individual and its grade may vary over time, place, and population.<sup>7</sup> Some factors affect compliance which include demographic factors, diseases, the personality of the individual, treatment, social factors, and doctor-patient relationship.<sup>8</sup>

According to World Health Organization, non-compliance to long-term medication for a chronic illness may lead to compromised health benefits and serious economic consequences.<sup>9</sup> In addition, non-compliance to the treatment has also been identified as a predominant reason for disease progression.<sup>10</sup> In view of this literature search, the current study was planned to generate evidence on hypertension in the elderly residing in rural areas focusing on factors affecting compliance to antihypertensive therapy. The aim of this study was to estimate the prevalence of hypertension and proportion of undiagnosed hypertension among elderly residing at rural areas and to determine the association of socio-demographic factors with hypertension and assess the level of compliance and factors affecting compliance to antihypertensive therapy among elderly.

### METHODS

The present study was a community-based cross-sectional study on the elderly (age  $\geq$  60 years) residing in rural areas. The study area included rural field practice in the area of the parent medical college. Considering the proportion of

hypertension in the elderly to be 0.41<sup>11</sup>, the margin of error of 5%, and at a 95% confidence level, the required sample size was 387. The elderly population of the rural field practice area was 923. Considering this sampling frame, the required sample size was collected by systematic random sampling.

Ethical approval was obtained from the Institutional Ethics Committee before data collection. The study period was 2 months. Inclusion criteria for the study were elderly population both males and females more than or equal to 60 years. Elderly persons who were too sick to respond, suffering from dementia, and not willing to participate were excluded. After obtaining written informed consent, a pre-designed, pre-tested proforma containing socio-demographic information, risk factors assessment, and general examination findings were filled up for each study participant. With the help of a mercury sphygmomanometer and stethoscope, blood pressure measurement was taken in a sitting position after 5 minutes of rest. Korotkoff sounds 1 and 5 were considered systolic and diastolic blood pressure (BP), respectively. After taking such 3 readings, the mean of these readings was considered as the final BP record. Elderly having BP records more than or equal to 150/90 were labeled as hypertensive as per JNC-8 criteria.<sup>12</sup>

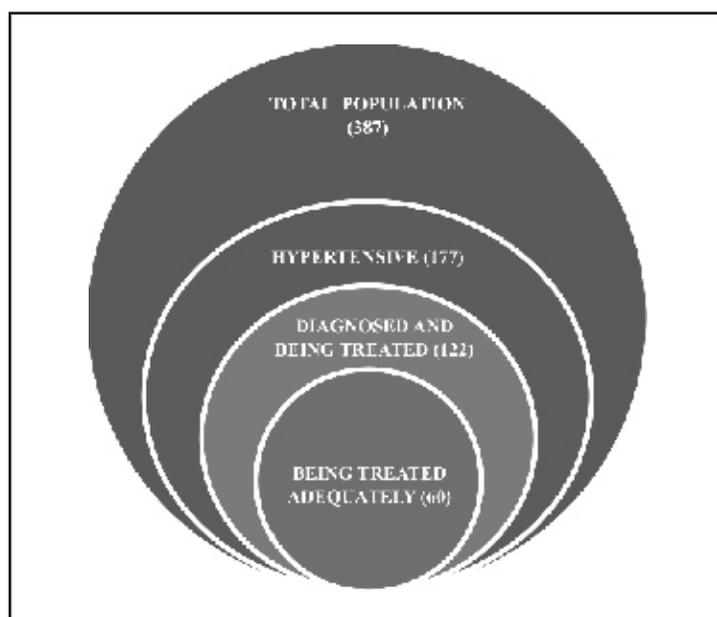
Those found hypertensive were inquired about medication. If on antihypertensive therapy, the 8-item-generic adherence assessment tool, Morisky Medication Adherence Scale (MMAS-8) was used to measure the extent of adherence or compliance to antihypertensive therapy. The patients were

considered compliant if they scored  $\geq 6$  points. Factors like personal feeling, forgetfulness, comorbidity, socio-demographic, economic, or side effects of the medications were assessed in both compliant and non-compliant hypertensive elderly.

Data was entered in a Microsoft Excel spreadsheet. For statistical analysis, SPSS version 26.0 (trial version) software was used. For qualitative data, percentages were calculated and Pearson's Chi-square test was applied to find the association between each discrete factor and compliance status. If the expected number in the cell was below 5 in a table, Yate's correction was applied. p-value of  $\leq 0.05$  was considered significant.

## RESULTS

Out of 387 recruited elderly in the current study, 236 were males and 151 were females. Hypertension being an iceberg disease is commonly known to follow the 'rule of halves'.<sup>13</sup> This means half of the population is hypertensive, out of which only half are detected, out of detected cases only half get treated, but adequate treatment is accessed to only half of them. In the current study, around half of the elderly (45.7%) were found hypertensive on examination. Positively, many of them (68.9%) were already diagnosed cases. This study detected 55 (31.1%) hidden/ previously undiagnosed cases of hypertension. All previously diagnosed cases were on treatment, but only half of them were being adequately treated. The same is depicted in a stacked Venn diagram (Figure).



**Figure :** Elderly from the rural area following hypertension rule of halves.

**Table 1: Association of socio-demographic factors with hypertension among elderly**

Variable	Category	Hypertensives N=177 n (%)	Non-hypertensives N=210 n (%)	p value
<b>Gender</b>	Male	112 (47.46)	124 (52.54)	0.456
	Female	65 (43.05)	86 (56.95)	
<b>Age group (years)</b>	60 - 69	112 (41.95)	155 (58.05)	0.194
	70 - 79	47 (54.65)	39 (45.35)	
	80 - 89	13 (56.52)	10 (43.48)	
<b>Literate</b>	90 and above	5 (45.45)	6 (54.55)	0.958
	Yes	24 (47.06)	27 (52.94)	
<b>Socio-economic class</b>	No	153 (45.54)	183 (54.46)	0.209
	I	4 (66.67)	2 (33.33)	
	II	15 (65.22)	8 (34.78)	
	III	22 (46.81)	25 (53.19)	
	IV	21 (50.00)	21 (50.00)	
<b>Smoking</b>	V	115 (42.75)	154 (57.25)	0.264
	Yes	26 (38.80)	41 (61.20)	
<b>Alcohol</b>	No	151 (47.19)	169 (52.81)	0.272
	Yes	26 (54.17)	22 (45.83)	
<b>Sedentary lifestyle</b>	No	151 (44.54)	188 (55.46)	0.107
	Yes	170 (44.97)	208 (55.03)	
<b>High salt intake</b>	No	7 (77.78)	2 (22.22)	0.389
	Yes	162 (45.00)	198 (55.00)	
<b>Family history of hypertension</b>	Yes	15 (55.56)	12 (44.44)	0.278
	Present	24 (54.54)	20 (45.46)	
<b>BMI</b>	Absent	153 (44.61)	190 (55.39)	0.042
	Obese	28 (60.87)	18 (39.13)	
	Non-obese	149 (43.70)	192 (56.30)	

p value < 0.05, significant

Among the study sample, 177 were found hypertensive and 210 were non-hypertensive. Statistical analysis showed only body mass index (BMI) to be significantly associated with hypertension among the elderly (Table 1).

Out of 122 previously diagnosed and treated cases, only 4 patients were found to show side effects and all were showing the same side effect that is bilateral pedal oedema. Total number of patients who were found with co-morbidities was 18 out of 122. Compliance was assessed only among those 122 elderly who were already detected hypertension cases. MMAS-8 tool used for measuring compliance found only 68 (55.7%) compliant elderly for taking antihypertensive medication. Factors affecting compliance to antihypertensive therapy among elderly were also assessed for significance as shown in table 2.

The elderly living with their families were significantly more compliant. The impact of compliance on blood pressure control was assessed. Among compliant, controlled blood pressure was found in 88.2% elderly;

while among non-compliant, controlled blood pressure was observed in only 27.7% elderly. This was statistically significant with  $p < 0.0001$ .

## DISCUSSION

Due to the absence of regular screening and unawareness of complications of hypertension among the elderly in rural areas, a large population remains undiagnosed and may suffer from long-term complications of hypertension. In the current study, nearly half (45.7%) of the elderly were hypertensive. The proportion of hypertensives found in the current study is similar to another study (40.5%) carried out in rural area.<sup>11</sup>

The current study successfully detected 55 undiagnosed cases of hypertension in the study area, which were further channelized for seeking management. In this study, only obesity was found to be significantly associated with hypertension. Gender, smoking, alcohol, high salt intake, and sedentary lifestyle were not significantly associated

**Table 2: Association of socio-demographic factors with compliance to antihypertensive among elderly**

Variable	Category	Compliant N=68 n (%)	Non-compliant N=54 n (%)	p value
<b>Gender</b>	Male	40 (54.05)	34 (45.95)	0.781
	Female	28 (58.33)	20 (41.67)	
<b>Age group (years)</b>	60-69	42 (57.53)	31 (42.47)	0.307
	70-79	16 (47.06)	18 (52.94)	
	80-89	6 (54.54)	5 (45.46)	
	90 and above	4 (100.00)	0 (0.00)	
<b>Literate</b>	Yes	11 (68.75)	5 (31.25)	0.393
	No	57 (53.77)	49 (46.23)	
<b>Socio-economic status</b>	I	1 (50.00)	1 (50.00)	0.702
	II	9 (75.00)	3 (25.00)	
	III	8 (53.33)	7 (46.67)	
	IV	8 (57.14)	6 (42.86)	
	V	41 (52.56)	37 (47.44)	
<b>Smoking</b>	Yes	10 (52.63)	9 (47.37)	0.964
	No	58 (56.31)	45 (43.69)	
<b>Alcohol intake</b>	Yes	7 (63.64)	4 (36.36)	0.814
	No	61 (54.95)	50 (45.05)	
<b>Marital status</b>	Married	66 (55.00)	54 (45.00)	0.58*
	Widow	2 (100.00)	0 (0.00)	
<b>Living with family</b>	Yes	68 (58.12)	49 (41.88)	0.036*
	No	0 (0.00)	5 (100.00)	
<b>Sedentary lifestyle</b>	Yes	63 (53.8)	54 (46.2)	0.115*
	No	5 (100.00)	0 (0.00)	
<b>High salt intake</b>	Yes	61 (54.95)	50 (45.05)	0.814
	No	7 (63.64)	4 (36.36)	
<b>Socially active</b>	Yes	66 (55.93)	52 (44.07)	0.782
	No	2 (50.00)	2 (50.00)	
<b>Family history of hypertension</b>	Present	11 (57.89)	8 (42.11)	0.964
	Absent	57 (55.34)	46 (44.66)	
<b>BMI</b>	Obese	8 (36.36)	14 (63.64)	0.074
	Non-obese	60 (60.00)	40 (40.00)	

p value < 0.05 , significant

with hypertension. One study has also identified overweight and obesity as a remarkable risk for hypertension.<sup>14</sup> Another study found that the prevalence of hypertension was higher among those aged more than 70 years, elderly females, less educated, and non-poor.<sup>15</sup>

Poor compliance was observed in this study among diagnosed cases of hypertensive elderly. Another study conducted among the elderly in rural setup also observed only 44.63% of the respondents adhered to anti-hypertensive drugs.<sup>16</sup> They reported that poor adherence to drugs was significantly associated with age, literacy, socioeconomic status, and presence of comorbidities; while in the current study only ‘staying with family’ emerged as a significant factor favoring compliance. One more study

has also found that participants with perceived strong family support adhere better to medication. Family support is an important positive factor; hence, the involvement of family members in treatment is crucial.<sup>17</sup>

A significant association of compliance with good blood pressure control proves the importance of compliance in the management of hypertension. If we know the factors affecting compliance, we can improve it by tackling the factors. Hypertension itself is a risk factor for other non-communicable diseases; hence good control of blood pressure by detecting undiagnosed cases and improving compliance can lower the increasing toll of non-communicable diseases in the current era.

## CONCLUSION

Nearly half of the elderly were hypertensive in this study. One third of them were previously undiagnosed cases of hypertension. Obesity is a significant factor associated with hypertension and for good compliance to therapy 'staying with family' is significantly beneficial. Maintaining compliance with antihypertensive is extremely important for controlling blood pressure levels.

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