INCIDENCE OF HYPERTENSION IN GERIATRIC PATIENTS IN A SOUTH INDIAN TERTIARY CARE TEACHING HOSPITAL

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ABSTRACT

To evaluate the incidence of Hypertension in the geriatric patients attending a tertiary Care teaching hospital. A prospective observational study was conducted between July 2013 and June 2014 in Department of General Medicine at Rajiv Gandhi Institute of Medical sciences (RIMS) an 800 bedded hospital, Kadapa. A total of 462 patients were studied in one year, out of 462, male patients were 203 (43.93%) and female patients were 259 (56.06%), age group of 60-69 years were more (43.72%) and above 80 years were least (15.35%), most of the patients were identified as illiterate (85.06%). 5-10 years disease duration consists higher population (48.21%) and least (6.4%) was observed in 20 years and above of disease duration. Major risk factors were identified as sedentary life style, alcohol consumption, diet (excess salt intake), cigarette smoking and minor risk factor as hereditary. Target organ damage like stroke, myocardial infarction, heart failure, chronic kidney disease and peripheral vasculature were observed. Blood pressures with systolic and diastolic elevations were recorded more (51.94%). Monotherapy was highly observed followed by double therapy and triple therapy was seen less, medication compliance was observed only in fewer patients (16.58%). HTN incidence was observed as 34.96%. Geriatric patients are vulnerable to the chronic ailments they should be provided with
utmost medical care by providing the appropriate medical, lifestyle and supportive circumstances.

**KEYWORDS:** Hypertension, Geriatrics, End organ damage, Morbidity.

**INTRODUCTION**

Hypertension is a common disease that is simply defined as persistently elevated arterial blood pressure (BP); it is now identified as one of the most significant risk factors for cardiovascular disease.\(^1\) According to the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC), normal blood pressure is considered as when Systolic BP is 120 mm Hg and Diastolic BP is <80 mm Hg.\(^2\) India’s aging population is progressively increasing in quantity with declining birth and death rates and also increasing the life expectancy. This tendency has established itself through the past adjoining decadal survey designs. Communicable diseases do not show a fixed pattern of change with the age of man. Nevertheless, non-communicable diseases like Hypertension (HTN) and their related complications develop more widespread in the old. A world health organization report states that NCDs account for at least 32% of all deaths in India with a word of caution that this could be an “under and inadequate estimation”.\(^3\) Hypertension is reported to be the fourth contributor to premature death in developed countries and the seventh in developing countries. Hypertension is common in very old people, approximately 80% of those aged over 65 are hypertensive.\(^4\) Hypertension affects most elderly people; these individuals are more likely to have organ damage or clinical cardiovascular disease.\(^5\) The emerging threat of non-communicable diseases is a matter of concern in our country in addition to the burden of endemic infections.\(^6\) Maintenance of independence and prevention of disability are primary goals in the clinical care of persons 65 years of age and older.\(^7\) The present study was taken up to profile the morbidity pattern and to calculate the incidence of hypertension in the geriatric attendee to tertiary care teaching health care set-up. While including the patients we have selected the patients of age 60 years and above as there may be world health organization definition of geriatrics (≥65 years) but most of the countries considering the geriatric population just after their completion of working age (15-59 years). The present study was undertaken to identify the incidence of hypertension in the geriatric population those who are attending the south Indian tertiary care teaching hospital.
MATERIALS AND METHODS

Study design: Prospective Observational Study.

Study period: July 2013 to June 2014 (1 year).

Study population: 462 Patients.

Study place: RIMS, an 800 bedded tertiary care teaching hospital, Kadapa.

Department: Department of General Medicine, male and female units (Inpatient)

Study Materials: Specially designed Patient data collection proforma.

Inclusion criteria: Patients suffering from HTN, of age ≥60 years.

Exclusion criteria: Patients suffering from other than HTN, immunosuppressive patients, chronic kidney diseases, cardiovascular diseases, pediatrics, pregnancy.

RESULTS

A total of 462 patients were followed during the study, of which male patients consists of 203 (43.93%) and female patients included 259 (56.06%) {Fig No. 1}.

Out of total 462 patients belonging to age group of 60-69 years comprises more (43.72%) and least included above 80 years of age (15.35%), Table No.1 furnishes the details of patients’ distribution based on age group.

![Fig No. 1: Distribution of patients based on gender](image-url)
Table No. 1: Distribution of Patients based on Age group

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age Group</th>
<th>N=462 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>60-69</td>
<td>109 (23.59)</td>
</tr>
<tr>
<td></td>
<td>70-79</td>
<td>97 (20.99)</td>
</tr>
<tr>
<td></td>
<td>≥80</td>
<td>37 (8.0)</td>
</tr>
<tr>
<td>Female</td>
<td>60-69</td>
<td>93 (20.13)</td>
</tr>
<tr>
<td></td>
<td>70-79</td>
<td>92 (19.91)</td>
</tr>
<tr>
<td></td>
<td>≥80</td>
<td>34 (7.35)</td>
</tr>
</tbody>
</table>

393 (85.06%) patients were recorded as illiterate persons in total of 462 patients, primary school education was seen in 10.17% of patients’ population and only 4.76% of secondary education was observed. Table No.2 furnishes the details of patients’ distribution based on Education.

Table No. 2: Distribution of Patients based on Education

<table>
<thead>
<tr>
<th>Education</th>
<th>N = 462 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>47 (10.17)</td>
</tr>
<tr>
<td>Secondary</td>
<td>22 (4.76)</td>
</tr>
<tr>
<td>Illiterate</td>
<td>393 (85.06)</td>
</tr>
</tbody>
</table>

Patients belonging to the 5-10 years of disease duration were recorded as high (48.21%), and the past history of above 20 years were seen least (6.4%). {Fig No. 2}.

Obesity, sedentary life style, alcohol consumption, diet (excess salt intake), cigarette smoking, hereditary were the identified risk factors in the patient population of which sedentary lifestyle recorded as the highest (25%) risk factor for the HTN and least one recorded as hereditary factor (4%). {Fig No. 3}
Fig No. 3: Distribution of patients based on Risk factors

Fig No. 4: Distribution of patients based on Target end organ damage

Stroke, myocardial infarction, heart failure, chronic kidney disease, peripheral vasculature were identified as target organ damage circumstances, of which stroke recorded as highest condition with 25% of its portion, least was seen with the myocardial infarction. (Fig No. 4).

Table No. 3: Distribution of Patients based on types of Blood pressures

<table>
<thead>
<tr>
<th>Gender</th>
<th>Systolic BP N (%)</th>
<th>Diastolic BP N (%)</th>
<th>Systolic &amp; Diastolic BP N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>58 (12.55)</td>
<td>26 (5.62)</td>
<td>119 (25.75)</td>
</tr>
<tr>
<td>Female</td>
<td>89 (19.26)</td>
<td>49 (10.6)</td>
<td>121 (26.19)</td>
</tr>
<tr>
<td>Total (N=462)</td>
<td>147 (31.81)</td>
<td>75 (16.22)</td>
<td>240 (51.94)</td>
</tr>
</tbody>
</table>

Patients were distributed according to the types of blood pressures; the highest percentage is seen in the case of systolic and diastolic BP elevations (51.94%) in most of the patients, only systolic elevation was seen in second highest populations of patient (31.81%) and the few cases were observed only with the diastolic elevations (16.22%). (Table no. 3).
Severity level was identified in the patients as shown in the table number 4, more number of patients lie in the moderate level of risk attributing elevations in the systolic and diastolic blood pressure (23.8%), followed by severe level of systolic and diastolic elevations (15.8%), less number of patients were observed in the case of severe level of elevations in the systolic and diastolic blood pressure (3.02%).

**Table No. 4: Distribution of Patients based on Severity level of BP**

<table>
<thead>
<tr>
<th>Type of BP</th>
<th>Severity Level</th>
<th>Range of BP (mmHg)</th>
<th>Male N (%)</th>
<th>Male N (%)</th>
<th>Total N=462 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Systolic BP</strong></td>
<td>Mild</td>
<td>120-140</td>
<td>22 (4.76)</td>
<td>31 (6.71)</td>
<td>53 (11.47)</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>140-160</td>
<td>28 (6.06)</td>
<td>37 (8)</td>
<td>65 (14.06)</td>
</tr>
<tr>
<td></td>
<td>Severe</td>
<td>&gt;160</td>
<td>9 (1.94)</td>
<td>21 (4.54)</td>
<td>30 (6.48)</td>
</tr>
<tr>
<td><strong>Diastolic BP</strong></td>
<td>Mild</td>
<td>80-90</td>
<td>6 (1.29)</td>
<td>18 (3.89)</td>
<td>24 (5.18)</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>90-115</td>
<td>17 (3.68)</td>
<td>19 (4.11)</td>
<td>36 (7.79)</td>
</tr>
<tr>
<td></td>
<td>Severe</td>
<td>&gt;115</td>
<td>2 (0.43)</td>
<td>12 (2.59)</td>
<td>14 (3.02)</td>
</tr>
<tr>
<td><strong>Systolic &amp; Diastolic BP</strong></td>
<td>Mild</td>
<td>140/90</td>
<td>22 (4.76)</td>
<td>35 (7.57)</td>
<td>57 (12.33)</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>160/115</td>
<td>49 (10.60)</td>
<td>61 (13.2)</td>
<td>110 (23.8)</td>
</tr>
<tr>
<td></td>
<td>Severe</td>
<td>&gt;160/115</td>
<td>48 (10.39)</td>
<td>25 (5.41)</td>
<td>73 (15.8)</td>
</tr>
</tbody>
</table>

Figure No. 5: Distribution of patients based on Mono-Therapy

Distribution of patients with the strategies of the treatment regimen was made of which most of the patients are with either mono or double therapy, less number of patients underwent with the triple therapy. Male and female patients were distributed separately accordingly to their treatment. Male patients were received calcium channel blockers more (50.2%) compared with highest percentage with beta-blockers (43.77%) in case of females. {Fig No. 5}
Beta-blockers, Calcium channel blockers, Angiotensin II receptor blockers, Diuretics and ACE- Inhibitors were administered in the combinations and designated each of the class with the number to identify the combination easily as shown in the figure number 6. Beta-blockers and calcium channel blockers were administered with highest percentage in both males and females with 44.97% and 63.27% respectively. Least administered combination was observed with the beta-blockers and ACE inhibitors (1.34%).

Triple therapy was seen in the case of fewer patients with the highest administered combination of beta-blockers, calcium channel blockers and diuretics in both the male and female patients with 77.24% and 83.57% respectively, {Fig No. 7}.

Medication compliance was very poor in the patients and it was observed as 83.43% of medication non-compliance was recorded {Fig No. 8}.

**Fig No. 6: Distribution of patients based on Double-Therapy**

1-β-blockers 2- Calcium channel blockers 3- Angiotensin II receptor blocker
4- Diuretics 5- ACE- Inhibitors

**Fig No. 7: Distribution of patients based on Triple-Therapy**

1-β-blockers 2- Calcium channel blockers 3- Angiotensin II receptor blocker
4- Diuretics
**Diabetes Incidence**

Diabetes mellitus (Type II) incidence was found to be 38.72% in the hypertensive geriatric patients.

**Hypertension Incidence in Geriatrics**

Hypertension incidence in the geriatric patients attending the tertiary care teaching hospital was observed as 34.96%, indicates the higher incidence of hypertension in geriatrics.

**DISCUSSION**

A prospective observational study was conducted for 1 year to detect the hypertension incidence in the geriatrics population. The present study observed that the hypertension was prevalent in females (56.03%) than in males (43.93%). Our results were supported by the study conducted by H.Tiwari et al.,\[^8\] study on prescription monitoring of anti-hypertensive drug utilization at Punjab health center India in 2004.

The incidence of HTN is more in between 60-69 years (23.59%) coincides with the results of Preethi et al.,\[^9\] studies on prescription pattern of anti-hypertensive at Annamalai university in 2010.

Literacy rate was very poor as the 85.06% of the patients were identified as illiterates, this may be due to incoming of patients mostly from rural areas and also it’s a government organisation with free treatment.

In our study large number of patients’ lies under 5-10 years duration (48.21%) of disease and these results deviates from the results of N.V.R. Praveen Kumar et al.,\[^10\] a study on
Prescription Monitoring of Antihypertensive Drug Utilization for Uncomplicated Hypertension Patients in a Tertiary Hospital: A Cross Sectional Study in the Inpatient Wards, where more number of patients were seen under 10-15 years of duration.

We observed that the majority of the risk factor was sedentary lifestyle (25%) and very less contributing risk factor identified as hereditary (4%), these are comparable with the Preethi et al, study.[9]

Stroke was identified as the major target organ damage in our study (25%) which is comparable with the results of Anand S et al[11] study on uncontrolled hypertension and increased risk for incident heart failure in older adults with hypertension: findings from a propensity-matched prospective population study showed 27% of stroke as a target organ damage.

Present study revealed that 51.94% patients were with the elevation in both systolic and diastolic B.P, moderate level of severity (23.8%) was observed in these cases and these results coincides with the study of Arash Rashidi et al study on Drug Treatment of Hypertension in older patients.

Present study revealed that β-blockers (Aten-50mg) were the drug of choice for hypertensive patients as a single drug therapy 55.23% and none of the patient prescribed diuretics alone, although it was reported as first line therapy for hypertension (JNC V, JNC VI) it may be due to adverse effect of diuretics on glucose homeostasis and lipid profile.

In present study β-blocker and calcium channel blockers (Aten-50mg+Amlog-5mg) combination was most often prescribed 63.27% in females and 44.97% in males and it was supported by H.Tiwari et al.[8] Females were prescribed more with this combination this may be due to adverse effect of β-blockers on sexual function in men. With this combination complementary synergistic effect was found, as β-blockers end to blunt the troublesome complementary reflex tachycardia induced by short acting dihydropyridine class of calcium channel blockers. The latter may additionally counteract any peripheral vasoconstriction caused by former, so there is no adverse drug interaction or poor tolerability.

In three drug regimen therapy, combination of β- blocker, calcium channel blocker and diuretics (Aten-50mg+Amlog-5mg+Frusemide-40mg) were prescribed majorly 83.57% and
least prescribed combination was Angiotensin II receptor blocker, diuretics and β- blocker, these coincides with the Preethi et al.[9]

According to the present study the incidence of diabetes mellitus (38.72%) was most common, it was supported by Preethi et al[9] study found that type-II diabetes mellitus (38.71%) was most common.

CONCLUSION
Hypertension is a major public health problem associated with debilitating and potentially deadly cardiovascular events, high incidence of HTN was observed in the geriatric population, although wide ranges of anti-hypertensive drugs are available still hypertension and its complications are major cause for adult morbidity and mortality. Under-utilization of diuretics in monotherapy and in combination therapy is noticed although it was first line therapy for hypertension. Mostly palpation method is being used for measuring blood pressure, this method indicates only systolic blood pressure leaving diastolic pressure, but to assess the patients HTN severity both the reading are necessary. Implementation of Auscultator method for measuring the blood pressure will help in the correct diagnosis of BP. Special care and education regarding adherence, diet and lifestyle modifications is to be provided to control blood pressure as results shown random variation in systolic and diastolic readings and are prone to end organ damage. Geriatric patients are vulnerable to the chronic ailments they should be provided with utmost medical care by providing the appropriate medical, lifestyle and supportive circumstances.

REFERENCES
5. ACCF/AHA 2011 Expert Consensus Document on Hypertension in the Elderly; A


