

www.jmscr.igmpublication.org

Impact Factor 3.79  
ISSN (e)-2347-176x



**Journal Of Medical Science And Clinical Research**

An Official Publication Of IGM Publication

## Epidemiology of Hypertension in Adults above 40 years in an Ethnic Community

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### Abstract

**Background:** Hypertension is one of the commonest cardiovascular disorders in both developing and developed countries. The prevalence of hypertension is seen on the rise in developing countries especially in urban areas with changing lifestyles and increasing longevity.

**Objectives:** The present study was undertaken to study the epidemiology of hypertension in an ethnic community of 'Telugu Vysyas', who are a predominantly business community residing in a coastal city of Berhampur, Southern Orissa.

**Materials and Methods:** A prevalence of hypertension of 35 % was used to derive the study population. Using a non-response rate of 15% and including others who volunteered for the study a total of 480 persons formed the study population. The study population was selected by Simple Random Sampling Technique. All the data that was collected was analyzed using SPSS version 12 (Statistical Package For Social Sciences) statistical software. Proportions were used to calculate the prevalence and Chi-square test were used for the statistical association between the various categorical variables.

**Results:** A prevalence of 23% for hypertension was found in the community. There was a significant association of hypertension with family history of cardiovascular diseases, addiction and consanguinity.

**Conclusion:** Prevalence of hypertension was high in the community in adults more than 40 years. Health education with Life style modification is advocated.

**Key words:** Hypertension, Telugu Vysya Community, Prevalence, risk factors

## Introduction

Hypertension is the commonest cardiovascular disorder posing a major public health challenge to societies in socioeconomic and epidemiological transition. It is a major risk factor for coronary heart diseases, stroke and renal failure. There are no well coordinated national surveys of prevalence of hypertension available from the Indian subcontinent. Several regional small surveys with varying protocols and using casual blood pressure readings have reported prevalence which vary widely from 3.80 % to 15.63% in men and 2% to 15.38% in women in urban areas.<sup>1-8</sup> one study in Rajasthan using blood pressure levels of Systolic Blood Pressure? 90 mm Hg found a prevalence rate of 30% in men and 34% in women.<sup>9</sup>

The present study was undertaken in an ethnic community of 'Telugu Vysyas' who are a predominantly business oriented community residing in a coastal city of Berhampur in Southern Orissa and bordering the state of Andhra Pradesh. The people of this community are affluent, sedentary and with a dietary preference for oily and fried foods. This community has all the risk factors of hypertension. Since no study was undertaken in this community before, the present study was done with the objective of studying the epidemiology of hypertension, prevalence and its associated risk factors taking the above mentioned characteristics of the community into consideration.

## Materials and Methods

A descriptive epidemiological study using cross-sectional survey was undertaken for a period of 2 months in Berhampur city using Multistage Simple Random Sampling Technique among the Telugu Vysya Community. The population of Berhampur was collected from the District Statistical Institute, Berhampur which was 2,10,418. The population of Telugu Vysya Community constituted 16000 members. Adults above 40 years were enlisted and they were around 4800 members. From the various studies

on hypertension and from a pilot study conducted in this community, it was therefore decided that a prevalence of hypertension of 35 % would be used to derive the study population. Using a non-response rate of 15% and including others who volunteered for the study a total of 480 persons formed the study population. The study population was selected by Simple Random Sampling Technique. The selected population were approached by the team of investigators at their doorsteps and they were interviewed by the help of predesigned and pretested questionnaire. After taking informed consent, the participants were interviewed and examined. The pilot study conducted earlier also helped to sort out the deficiencies of the questionnaire. The questionnaire was initially framed English and subsequently it was translated into Telugu language to facilitate collection of data from the study subjects. The questionnaire included various items on socio-demographic profile, occupation, present and past morbidities, addictions, family history of Diabetes, Coronary Heart Disease, Renal Disease, Hypertension and premature deaths.

The measurement of blood pressure was done in the following way. The study participants were made to sit comfortably for 5 minutes before BP was measured. Blood pressure was measured using the auscultatory method with a standardized calibrated mercury column type sphygmomanometer and an appropriate sized cuff encircling at least 80% of the arm in the seated posture, with feet on the floor and arm supported at heart level. The first blood pressure measurement was recorded after obtaining socio-demographic information from the study subject, while the second was recorded after a brief clinical examination. The reading at which korotkoff sound is first heard will be considered as systolic blood pressure and at which the korotkoff sound disappears will be taken as diastolic blood pressure. The average of two readings of SBP and DBP to describe the blood pressure of the participant. In cases where the two readings

differed by over 10 mm of Hg, a third reading was taken and average of the three measurements was taken.

All the data that was collected was analyzed using SPSS version 12 (Statistical Package For Social Sciences) statistical software .Proportions were used to calculate the prevalence and Chi-square test were used for the statistical association between the various categorical variables.

### Results

A total of 480 persons above 40 years were selected for the study of which 240(50%) were males and 240(50%) were females. Majority 134(27.9%) of the study population were in the age group of 40-45 years. Senior citizens (>65 years) constituted 19.5%.(Table-I).

110 hypertensives were identified in the study population. This gives a prevalence of 23% for hypertension in the community. Most 56(14%) of the hypertensives were in the age group of more than 60 years. A statistically significant association was found between age and hypertension.( $p<0.001$ ). However the association between sex and hypertension was not found to be significant.( $p>0.05$ ). (Table-II).

The various categories of hypertension identified in the study population were,

86(18%) were observed to be mild hypertensives, 18(4%) were of borderline hypertension, 24 (5%) were observed to have moderate and severe hypertension, 48(10%) were having Isolated Systolic hypertension while 46(9.6%) were

observed to have borderline Isolated Systolic hypertension. (Table-III).

The study population was classified as per Garrow's classification of obesity status.<sup>12</sup> Out of 110 hypertensives, 8(7.2%) were undernourished, 42 (38.2%) were normal , 34(31%) were of Grade I, 26(23.6%) were of Grade II and none of them were of Grade III obesity. The association of obesity and hypertension was however not found to be significant in this study. ( $p>0.05$ ). (Table-IV).

Among the 110 hypertensives, 40(36.4%) had a family history of cardiovascular diseases. The association of family history of cardiovascular diseases and hypertension was found to be statistically very highly significant.( $p<0.001$ ). (Table-V).

14(12.7%) of the 110 hypertensives were found to have one or more addictions of smoking, chewing tobacco, gutkha and drinking alcohol. The association between addiction and hypertension was found to be highly significant.( $p<0.01$ ). (Table-VI).

96(20%) persons out of 480 study populations were found to have consanguineous marriages. 30 (31%) persons out of total 96 persons who had consanguineous marriages were found to be hypertensive. 14(46.6%) hypertensives among the subgroup of 30 hypertensives had a family history of both consanguinity and hypertension. The association of hypertension with persons who had a positive family history of both consanguinity and hypertension was found to be statistically highly significant. .( $p<0.01$ ). (Table-VII).

**Table I** Distribution of study population by age and sex

| Age (years) | Males | Females | Total(%)  |
|-------------|-------|---------|-----------|
| 40-45       | 54    | 80      | 134(27.9) |
| 46-50       | 54    | 36      | 90(18.8)  |
| 51-55       | 42    | 26      | 68(14.2)  |
| 56-60       | 28    | 24      | 52(10.8)  |
| 61-65       | 16    | 26      | 42(8.8)   |
| >65         | 46    | 48      | 94(19.5)  |
| Total       | 240   | 240     | 480(100)  |

**Table II** Distribution of study population as per presence or absence of hypertension

| Age (years) | Hypertensives |         |               | Normotensives |         |               | Total(%) |
|-------------|---------------|---------|---------------|---------------|---------|---------------|----------|
|             | Males         | Females | Sub-total (%) | Males         | Females | Sub-total (%) |          |
| 40-50       | 14            | 4       | 18(8)         | 94            | 112     | 206(92)       | 224(100) |
| 51-60       | 16            | 20      | 36(30)        | 52            | 32      | 84(70)        | 120(100) |
| >60         | 24            | 32      | 56(41)        | 38            | 42      | 80(59)        | 136(100) |
| Total       | 54            | 56      | 110(23)       | 184           | 186     | 370(77)       | 480(100) |

$X^2 = 57.032, df=2, p<0.001$      $X^2 = 0.0137, df=1, p>0.05$

**Table III** Distribution of study population as per WHO classification of hypertension

| Blood pressure                      | Study population (%) |
|-------------------------------------|----------------------|
| Normotension                        | 370(77)              |
| Mild hypertension                   | 86(18)               |
| Subgroup : Borderline hypertension  | 18(4)                |
| Moderate and Severe hypertension    | 24(5)                |
| Isolated Systolic hypertension(ISH) | 48(10)               |
| Sub group : Borderline ISH          | 46(9.6)              |

**Table IV** Relationship between BMI, Obesity Status and hypertension

| BMI(kg/m <sup>2</sup> ) | Obesity status as per Garrow | Hypertension (%) | Normotensives (%) | Total(%) |
|-------------------------|------------------------------|------------------|-------------------|----------|
| <20                     | -                            | 8(18)            | 36(82)            | 44(100)  |
| 20-24.9                 | Normal                       | 42(20)           | 170(80)           | 212(100) |
| 25-29.9                 | Grade-I                      | 34(20)           | 134(80)           | 168(100) |
| 30-40                   | Grade-II                     | 26(46)           | 30(54)            | 56(100)  |
| >40                     | Grade-III                    | 0(0)             | 0(0)              | 0(0)     |
| Total                   |                              | 110(23)          | 370(77)           | 480(100) |

$X^2 = 3.58, df=1, p>0.05$

**Table V** Relationship between family history of cardiovascular diseases and hypertension

| Family history of cardiovascular diseases | Hypertensives(%) | Normotensives(%) | Total(%) |
|---|------------------|------------------|----------|
| Present                                   | 40(34)           | 76(66)           | 116(100) |
| Absent                                    | 70(19)           | 294(81)          | 364(100) |
| Total                                     | 110(23)          | 370(77)          | 480(100) |

$X^2 = 11.58, df=1, p<0.001$

**Table VI** Relationship between addiction and hypertension

| Addiction | Hypertensives(%) | Normotensives(%) | Total(%) |
|-----------|------------------|------------------|----------|
| Present   | 14(44)           | 18(56)           | 32(100)  |
| Absent    | 96(21)           | 352(79)          | 448(100) |
| Total     | 110(23)          | 370(77)          | 480(100) |

$X^2 = 8.533, df=1, p<0.01$

**Table VII** Relationship between family history of hypertension and consanguinity with hypertension

| Family history                         | Hypertensives(%) | Normotensives(%) | Total(%) |
|--|------------------|------------------|----------|
| Consanguinity +ve and hypertension +ve | 14(50)           | 14(50)           | 28(100)  |
| Consanguinity +ve and hypertension -ve | 16(24)           | 52(76)           | 68(100)  |
| Total                                  | 30(31)           | 66(69)           | 96(100)  |

$X^2 = 6.604, df=1, p<0.01$

### Discussion

The prevalence of hypertension in the study population of the community was found to be 23%. This is also supported by a study done by Kumar et al<sup>13</sup> who found the prevalence of hypertension to be 24% among the employees of a mega industry of South Gujarat. It also compares closely to the observations in a study by Anand PM<sup>14</sup> regarding the prevalence of hypertension (26.86%) among Mumbai executives. It was also found that 20% of the people aged 3-64 years have hypertension in societies as diverse as those of USA and parts of China.<sup>15</sup> In some industrialized countries up to 25% of adults have diastolic pressure above 90 mm Hg.<sup>16</sup>

It was observed in the present study that hypertension is significantly associated with age and rises commensurately with age. Kumar et al<sup>13</sup> had a similar observation in his study.

Obesity has adverse effects on health and longevity in both young and old individuals have an increased overall mortality rate compared to the normal weight population.<sup>17,18</sup> The association with obesity is also reflected in the study though it was not found to be statistically significant. This is in contrast to observation made by Kumar et al<sup>13</sup> who found the prevalence of hypertension was high in obese and overweight compared to others and this difference was statistically significant.

The presence of addictions and a positive family history of cardiovascular diseases had a significant association with hypertension in the community. Similar observations were made by Kumar et al<sup>13</sup> that prevalence rates of hypertension were significantly high in persons consuming alcohol and or tobacco. This is also reported in other studies where higher prevalence of hypertension is found in those who smoke or take alcohol.<sup>19,20</sup>

In the community where consanguineous marriages are known to occur commonly, the study highlights the enhanced risk of hypertension associated with consanguinity.

### Conclusion

This study is a modest attempt to study the epidemiology of hypertension, its prevalence and associated risk factors in an ethnic business community. It was done in adults more than 40 years. Since hypertension is a problem with its ramification spread over a larger age group, a large scale and a comprehensive epidemiological study with laboratory investigations involving study subjects 18 years and above is planned and is on the anvil. Awareness and health education concerning lifestyle diseases and other non-communicable diseases as a whole meanwhile is carried out among the community.

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