



## A COMPARATIVE STUDY ON PREVALENCE AND ASSOCIATED RISK FACTORS OF HYPERTENSION IN RURAL AND URBAN FIELD PRACTICE AREA OF GUNTUR MEDICAL COLLEGE.

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### ABSTRACT

**Introduction:** Hypertension is a major public health problem and greatest challenge of 21<sup>st</sup> century. Hypertension was reported to be fourth contributory factor to premature death in developed countries and the seventh in developing countries. According to Office of Register General of India, the prevalence of hypertension in urban population is 25% and 10% in rural population. **Methodology:** A cross-sectional comparative study was conducted among 570 individuals whose age is more than 18 years in the rural field practice area of Guntur medical college in both urban and rural. A simple random sampling was used to select the sample size. Data was collected using questionnaire and data analysis was done using excel and SPSS software. **Results:** study shows that 26.3% of study subjects residing in urban area were hypertensive and 33% of study subjects residing in rural areas were hypertensive. Among those who have the habit of alcohol consumption, the prevalence of hypertension was 57.1% in urban residents and 60.6% in rural residents. Similarly among those who does not have the habit of alcohol consumption, the prevalence was 20.9% in urban residents and 25.4% in rural residents. **Conclusions:** non modifiable risk Factors like age, gender, family history are significantly associated with hypertension with p value less than 0.05, some modifiable risk factors like BMI, smoking history, high salt intake are also associated with hypertension.

**KEYWORDS :** Hypertension, world health organization, disability adjusted life years.

### INTRODUCTION

Hypertension is a major public health problem and greatest challenge of 21<sup>st</sup> century. Hypertension was reported to be fourth contributory factor to premature death in developed countries and the seventh in developing countries. Recent reports indicate that nearly 1 billion adults had hypertension and this is predicted to increase to 1.56 billion by 2025<sup>1</sup>. The World Health Organization and the Seventh report of Joint National Committee on Prevention, Detection, Evaluation and Treatment of high blood pressure (JNC-7) defines hypertension as systolic blood pressure more than or equal to 140mm Hg and diastolic blood pressure more than or equal to 90mm Hg.<sup>1</sup>

World-wide, prevalence estimates for hypertension is about 1 billion Individuals. It causes about 7.1 million deaths per year and 4.5% of the disease burden which translates to 64 million disability adjusted life years (DALYs)<sup>2</sup>. The latest WHO Statistics report 2020 reveals that worldwide prevalence of hypertension is 29.2% for males and 24.8% for females. In the year 2015 the World Health Organization issued a plan 2012-2013 for NCD prevention and control which offers the health community a new global goal to reduce death rates from all chronic diseases by 2% per year over above<sup>3</sup>.

Review of epidemiological studies suggests that the prevalence of hypertension has increased in both urban and rural subjects and presently is 25% in urban adults and 10-15% among rural adults<sup>4</sup>. Accordingly to WHO statistics 2013 the prevalence of hypertension in India is 23% in males and 21% in females. According to WHO Statistics 2012 the prevalence of hypertension in India is 23% (urban 23.1%, rural 22.6%)<sup>8</sup>. According to Office of Register General of India, the prevalence of hypertension in urban population is 25% and 10% in rural population. The number of people with hypertension will rise from 118.2 million in 2000 to 213.5 million by 2025<sup>10</sup>. hence the present study was to compare prevalence of Hypertension and its associated risk factors among rural and urban populations in Guntur district.

### OBJECTIVES:

1. To measure the prevalence of Hypertension in rural and urban communities.
2. To elucidate the associated risk factors.
3. To measure the relation between socio economic status and prevalence of hypertension.

### MATERIALS & METHODS:

**Study Design and Population:** A descriptive cross-sectional comparative study was carried out in Guntur district is located in central Andhra Pradesh with a population of 7,54,354. Two field practice areas (one rural and one urban) of department of community medicine, Guntur Medical College were taken for the study with similar population. They are Tadikonda village and Mallikharjuna peta respectively. Study population comprised of persons with age 18 years & above in an urban and rural community in field practice area over a period of 3 months from (jan 2024 to march 2024).

**Sample Size :** Sample size was calculated using the formula  $n = 4pq / I^2$  Where, n is the required sample size p = prevalence of hypertension i.e. 15%<sup>5</sup>, q = 100 - p = 100 - 15 = 85, I = Allowable error which is taken as 20% of p = 20% of 15 = 3:  $n = 4pq / I^2 = 4 \times 15 \times 85 / 3^2 = 570$ .

### Inclusion Criteria

- All persons aged 18 years and above who are willing to participate in the study.

### Exclusion Criteria:

Persons less than 18 years, severely morbid subjects hospitalized at the time of study and persons not available at the time of study in spite of 3 home visits.

**Sampling Method:** A simple random technique was used to reach the desired sample size.

**Data Collection Tool:** The pre-tested Structural Questionnaire consists of 2 parts. The first part sought information on the Socio-demographic aspects like Sex, Age, Education, Occupation, Income, and Socio economic status, Marital Status, Type of Family, and Family History of

Hypertension. The Second part includes information on Blood Pressure, Obesity, Smoking, Alcohol, Physical activity, Diet., Anthropometry.

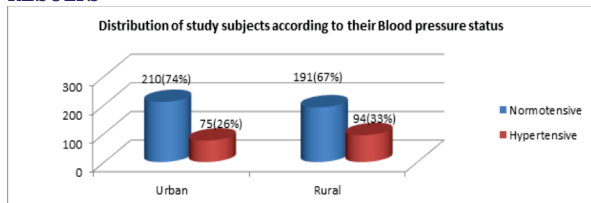
**Data Collection**

All the subjects were personally contacted in their house, informed consent taken, interviewed using the pre-tested proforma. On visiting the family, baseline data of the family members was taken using section I of the proforma and persons above 18 years were screened by taking two BP readings at an interval of 3mins. Least of the two readings was considered. Those found to have hypertension were examined in detail and further history was recorded in section II of the proforma.

**Data Analysis and Interpretation**

Data analysis was done using MS EXCEL software. Both Descriptive and Inferential Statistics were used. Percentage distribution utilized bars and graphs; standard deviation was used to assess the prevalence of selected modifiable risk factors of hypertension; and inferential statistics like "Chi" square was used to study the strength of the association of data with demographic variables

**RESULTS**



**Fig 1:** Distribution of study subjects according to their Blood pressure status. (n=570)

Fig:1 shows that 26.3% of study subjects residing in urban area were hypertensive and 33% of study subjects reading in rural areas were hypertensive. But the difference was found to be statistically not significant. (p>0.05). The overall prevalence of hypertension in the present study was found to be 29.6% in both urban and rural areas.

**Table -1 Distribution Of Hypertensive Subjects According To Their Age (n=570)**

Age (years)	Urban			Rural			p-value
	Total	Hyper-tensive	Percent	Total	Hyper-tensive	Percent	
18-29	57	2	3.5%	33	2	6.1%	0.62
30-39	104	30	28.8%	95	16	16.8%	0.63
40-49	69	22	31.9%	67	34	50.7%	0.04
50-59	34	16	47.1%	49	23	46.9%	1.00
60-69	13	5	38.5%	31	15	48.4%	0.74
>69	8	0	0.0%	10	4	40.0%	0.09
Total	285	75	26.3%	285	94	29.6%	0.08

Table 4 shows that in urban area, the prevalence of hypertension was more among 50-59 years age group (47.1%) followed by 60-69 years group (38.5%) followed by 60-69 years group (48.4%).

The prevalence of hypertension among 40-49 years age group was 31.9% in urban areas and 50.7% in rural areas. The difference was found to be statistically significant.(p<0.05).

**Table :2. Gender Wise Distribution Of Hypertensive Subjects (n=570)**

Gender	Urban			Rural			p-value
	Total	Hyper-tensive	Percent	Total	Hyper-tensive	Percent	
Male	134	53	39.6%	123	26	21.1%	<0.01
Female	151	22	14.6%	162	68	42.0%	<0.01

Total	285	75	26.3%	285	94	29.6%	0.08
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Table 2 shows that the prevalence of hypertension among urban males was 39.6% and among rural males it was 21.1%.The difference was found to be statistically significant.(p<0.05). Similarly the prevalence of hypertension among urban females was 14.6% and among rural females it was 42%. The difference was found to be statistically significant. (p<0.05).

**Table 3: Association Of Hypertension To Family History (n=570)**

Family history	Urban			Rural			p-value
	Total	Hyper-tensive	Percent	Total	Hyper-tensive	Percent	
Present	76	29	38.2%	47	29	61.7%	0.02
Absent	209	46	22%	238	65	27.30%	0.31
Total	285	75	26.3%	285	94	33.0%	0.08
p-value	<0.01			<0.01			

Table 3 shows that the prevalence of high blood pressure among those who had a family history of hypertension was 38.2% in urban residents and 61.7% in rural residents. The difference was found to be statistically significant.

**Table -4 : Distribution Of Hypertensive Subjects According To Their Occupational Status. (n=570)**

Occupation	Urban			Rural			p-value
	Total	Hyper-tensive	Percent	Total	Hyper-tensive	Percent	
Unskilled	172	30	17.4%	206	72	35.0%	<0.01
Semiskilled	49	28	57.1%	56	18	32.1%	<0.01
Skilled	25	6	24.0%	20	4	20.0%	0.52
Managerial	11	7	63.6%	-	-	-	-
Professional	4	2	50.0%	2	0	0.0%	0.47
Total	261	73	28.0%	284	94	33.1%	0.23

Table 4 shows that the prevalence of hypertension among urban residents was more among managerial occupation (63.6%) followed by semiskilled (57.1%) and professional occupation (50%). Among rural respondents prevalence was more in unskilled workers (35%) followed by semiskilled workers (32.1%). There was statistically significant difference in prevalence of hypertension among urban residents and rural residents with respect to persons belonging to unskilled occupations (p<0.05).

**Table 5 Distribution Of Hypertensive Subjects According To Socio Economic Status (n=570)**

Socio economic status	Urban			Rural			p-value
	Total	Hyper-tensive	Percent	Total	Hyper-tensive	Percent	
II	2	2	100.0%	0	0	0%	-
III	114	33	28.9%	141	43	30.5%	0.89
IV	121	34	22.5%	124	31.5%	0.10	0.023
V	18	6	33.3%	20	12	60.0%	0.12
Total	285	75	26.3%	285	94	33.0%	0.08

Note : SES calculated using BG Prasad Scale 1035

Table 5 shows that the prevalence of hypertension among urban residents was more among those belonging to class II Socio Economic status (100%) followed by those belonging to class V (33.3%) and class III (28.9%). Among rural respondents prevalence was more among those belonging to class V socio economic status(60%) followed by those belonging to class IV (31.5%). There was no statistically significant difference in prevalence of hypertension among urban residents and rural residents with respect to any of the socio economic class (p>0.05).

**Table 6: Association Between Hypertension And Body Mass Index (n= 169)**

Body Mass index (Kg/m2)	Urban			Rural			p-value
	Total	Hyper-tensive	Per-cent	Total	Hyper-tensive	Per-cent	

<18.5	1 (0.003%)	0	0%	3 (0.01%)	0	0%	-
18.5-24.99	93 (32.7%)	15	16.1%	64 (22.4%)	18	28.1%	0.08
25-29.99	130 (45.7)	43	33.1%	155 (54.4%)	49	31.6%	0.8
30 and above	61 (21.6%)	17	27.9%	63 (22.1%)	27	42.9%	0.09
Total	285 (100%)	75	26.3%	285	94	33.0%	0.08

Table 6 shows that 45.7% of urban residents and 54.4% of rural residents have BMI between 25-29.99 (Over weight). 21.6% of urban residents and 22.1% of rural residents have BMI of 30 and above (Obesity). The prevalence of hypertension among urban residents was more among those whose BMI was in the range of 25-29.99 (33.1%) followed by 30 and above (27.9%). Among rural respondents prevalence was more among those whose BMI was in the range of 30 and above (42.9%) followed by 25-29.99 (31.6%). There was no statistically significant difference in prevalence of hypertension among urban residents and rural residents with respect to BMI ( $p < 0.05$ ).

**Table 7: Association Of Hypertension To Salt Consumption (n=169).**

Salt consumption (g/day)	Urban			Rural			p-value
	Total	Hyper-tensive	Per-cent	Total	Hyper-tensive	Per-cent	
<5	0	0	0%	2 (0.8%)	2	100.0%	-
5 and above	285 (100%)	75	26.3%	283 (99.2%)	92	32.5%	0.12
Total	285 (100%)	75	26.3%	285 (100%)	94	33.0%	0.08

Note : - percentage in brackets are column percentages

Table 10 shows that all the urban residents (100%) and 99.2% of rural residents have per capita salt consumption of more than 7 grams per day. Among urban residents the prevalence of hypertension in those who has a salt consumption of more than 7 grams per day was 26.3%. Similarly among rural residents the prevalence among those who consume more than 7 grams per day was 32.5%. This difference was found to be statistically not significant. ( $p > 0.05$ ).

**Table : 8 Association Between Frequency Of Smoking And Hypertension (n=61).**

No of cigarettes per day	Urban			Rural			p-value
	Total	Hyper-tensive	Percent	Total	Hyper-tensive	Percent	
≤20	33	14	42.4%	24	6	25.0%	0.2
>20	41	27	65.9%	40	14	35.0%	<0.01
Total	74	41	55.4%	64	20	31.3%	
p-value	0.04			0.4			

Table 8 shows that among those who smoke less than 20 cigarettes per day, the prevalence of hypertension was 42.4% in urban residents and 25% in rural residents. This difference was found to be statistically significant. ( $p > 0.05$ ). Similarly among those who smoke more than 20 cigarettes per day, the prevalence was 65.9% in urban residents and 35% in rural residents and the difference was found to be statistically significant ( $p < 0.05$ ).

**Table 9: Distribution Of Hypertensive Subjects Based On Duration Of Alcohol Consumption.(n=61)**

Alcohol duration (years)	Urban			Rural			p-value
	Total	Hyper-tensive	Percent	Total	Hyper-tensive	Percent	
≤10	20	8	40.0%	38	21	55.3%	0.3
>10	22	16	72.7%	23	16	69.6%	0.81
Total	42	24	57.1%	61	37	60.6%	0.72
p-value	0.03			0.3			

Table 9 shows that among those who have been consuming alcohol for less than 10 years, the prevalence of hypertension was 40% in urban residents and 55.3% in rural residents. This difference was not found to be statistically significant. ( $p > 0.05$ ). Similarly among those who have been consuming alcohol for more than 10 years, the prevalence was 72.7% in urban residents and 69.6% in rural residents and the difference was found to be statistically non-significant. ( $p > 0.05$ ).

**Table 10: Association Between Hypertension And Physical Activity (n= 169)**

Physical activity	Urban			Rural			p-value
	Total	Hyper-tensive	Per-cent	Total	Hyper-tensive	Per-cent	
Yes	84 (29.4%)	11	13.1%	122 (42.8%)	25	20.5%	0.19
No	201 (70.6%)	64	31.8%	163 (57.2%)	69	42.3%	0.04
Total	285 (100%)	75	26.3%	285 (100%)	94	33.0%	0.08

Note – percentages in brackets are column percentages

Table 10 shows that 29.4% of urban residents and 42.8% of rural residents do physical activity daily. Physical inactivity was seen in 70.6% of urban residents and 57.2% of rural residents. Among those who do physical activity regularly, the prevalence of hypertension was 13.1% in urban residents and 20.5% in rural residents. This difference was found to be statistically significant. ( $p > 0.05$ ).

Similarly among those who do not do physical activity regularly, the prevalence was 31.8% in urban residents and 42.3% in rural residents and the difference was found to be statistically significant. ( $p > 0.05$ ).

**Table 11: Association Between Hypertension And Stress (n=169)**

Stress	Urban			Rural			p-value
	Total	Hyper-tensive	Per-cent	Total	Hyper-tensive	Percent	
Present	190 (66.6%)	65	34%	103 (36.1%)	65	63%	<0.01
Absent	95 (33.4%)	10	11%	182 (63.9%)	29	26%	0.28
Total	285 (100%)	75	26%	285 (100%)	94	33%	0.08

Note – percentages in brackets are column percentages

Table 11 shows that the prevalence of any form of stress among urban residents was 66.6% and among rural residents the prevalence was 36.1%. Among those who have stress, the prevalence of hypertension was 34% in urban residents and 63% in rural residents. This difference was found to be Statistically significant. ( $p < 0.05$ ).

Similarly among those who do not have stress, the prevalence was 11% in urban residents and 16% in rural residents and the difference was found to be statistically significant. ( $p < 0.05$ ).

**DISCUSSION**

In the present study, the overall prevalence of hypertension in the study population was found to be 29.6%. This is in consensus with the latest WHO Statistics report of 2013 which revealed that worldwide prevalence of hypertension is 29.2% for males and 24.8% for females.

The prevalence of hypertension in urban areas is found to be 26.3%. These results were much comparable to the rates obtained by Shymalkumar et al study on prevalence of hypertension in urban population of west Bengal,

representing eastern India, where the prevalence of hypertension has been reported to be 24.9% in urban adults. Similar prevalence rate of hypertension in urban population was obtained by Jasmine S Sundar, in a study conducted in Chennai. Tamil nadu (2013), among 400 subjects was found to be 21.5% and by Chandwani Het al<sup>5</sup> conducted cross sectional study on prevalence and correlates of pertension among adults aged above 20 years, in the urban area of Jamnagar, Sarat in 2010, where it was found to be 24%.

In the present study, the prevalence of high blood pressure among those we had a family history of hypertension was 38.2% in urban residents and 61.7% in Aral residents. The difference was found to be statistically significant. (p0.05) teniological studies suggest that 20-60% of essential HTN is inherited and the aising is acquired or environmental. So the present study findings are in consensus with that.

A study done by Chadha SL et al<sup>7</sup>, in Delhi revealed that 21%urban men, 33%urban women, 10% rural men and 10% rural women were obese. The prevalence of obesity in this study was similar to the prevalence of obesity among urban residents in our present study (21.6%).

In the National CSI study 78% of hypertensives were found to be leading a sedentary life-style compared to 49% of controls. This is in consensus with the present study findings where the prevalence of hypertension was more among those who are not doing physical activity regularly when compared to prevalence of hypertension in those who do physical activity regularly (31.8% in urban residents and 42.3% in rural residents).

## CONCLUSION

A Cross Sectional comparative study on prevalence of Hypertension and risk actors among rural and urban populations in Guntur district was conducted in a rural and urban area of Guntur district. The study revealed the following findings: In urban area more than one third of the study population (37%) belong to the age group of 30-39 years. Similarly in rural area also, one third (33%) belong to 30-39 years age group. Majority of study population in the present study was females (55%). Both In urban area and rural area, more than half of the respondents are females (53% and 57% respectively). The overall prevalence of hypertension in the present study was found to be 29.6% in both urban and rural areas. 26.3% of study subjects residing in urban area were hypertensive and 33% of study subjects residing in rural areas were hypertensive. But the difference was found to be statistically not significant. (p > 0.05).

Among those who have the habit of alcohol consumption, the prevalence of hypertension was 57.1% in urban residents and 60.6% in rural residents. Similarly among those who does not have the habit of alcohol consumption, the prevalence was 20.9% in urban residents and 25.4% in rural residents.

Among those who do physical activity regularly, the prevalence of hypertension was 13.1% in urban residents and 20.5% in rural residents. Similarly among those who do not do physical activity regularly, the prevalence was 31.8% in urban residents and 42.3% in rural residents.

## Study Limitations

1. Results of the present study cannot be generalized to the population of India due to differences in socio-economic variables, dietary habits and cultural practices existing in the country.
2. Since the study elicits the smoking, physical inactivity, diet, alcohol in the past months, the possibility of recall bias cannot be ruled out.

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