

**Original Research Paper****Geographical distribution (Rural and Urban) of Hypertensive Patients and associated Risk Factors**

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Abstract

Hypertension is a major public health problem all over the world along with its fatal cardiovascular complications.

Aims and Objectives: *In the present study we assess the distinction of hypertension in rural and urban population in Rewa district and risk factors associated.*

Materials and Methods: *In this prospective randomized observational study 148 selected hypertensive patients are firstly categorized on the basis of their residence i.e. Rural/Urban then according to level of hypertension, age, sex, family size, body mass index, family history and lastly most important distinction between old and new patients.*

Result: *In the present study we found that the occurrence of hypertension is more common feature of urban rather than rural area. Multivariate factors like body mass index, Family size, Family history addiction, associated diseases are more likely to increase the event in urban area.*

Conclusions: *In the present study we observed that hypertension is more common in urban in comparison with rural population. It is due to stressful, exhausting and tedious life of urban people than rural areas where life is hard working with limited ambitions. This can be reduced by providing socio-economically healthy life to the society.*

Keywords: *Rural, Urban, Hypertension.*

Introduction

Hypertension (HTN) is an increasingly major public health problem globally, it is defined when systolic blood pressure (SBP) was ≥ 140 mm Hg and/or diastolic blood pressure (DBP) was ≥ 90 mm Hg according to Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure^[1].

Hypertension is one of the commonest risk factors for many cardiovascular diseases^[2]. It already affects more than one billion people worldwide, results in heart attacks and strokes^[3]. HTN is directly responsible for 57% of all stroke death and 24% of all coronary heart disease (CHD) related deaths in India^[4]. Complications from hypertension account for 9.4 million deaths

worldwide every year^[5]. The estimated HTN prevalence for the population aged 20 and over was 26.4% globally in 2000 (26.6% for men and 26.1% for women), and there is a probably increase in the HTN prevalence to 29.2% for both men and women by 2025^[6].

According to the WHO 2008 estimates, the prevalence of hypertension in Indians was 32.5% (33.2% in men and 31.7% in women)^[7]. Recent studies from India have shown the prevalence of HTN to be 25% in urban and 10% in rural people [4, 8, and 9]. The rates for HTN in percentage are expected to go up to 22.9 and 23.6 for Indian men and women, respectively by 2025^[10]. Kearney *et al* in their paper predicted that the burden of hypertension in India is expected to almost double from 118 million in 2000 to 213.5 million by 2025^[10].

Although the importance of blood pressure is recognized as a risk factor for CVDs, and inexpensive treatments are available, the HTN prevalence is dramatically increasing in low- and middle-income countries^[10]. The factors of age, sex, and race are well established in the explanation of the differences in the HT prevalence^[11]. Moreover, research in different continents, countries, regions, and populations within the same countries all indicate significant regional variations^[12,13]. These variations may indicate differences in the demographic and epidemiological changes in various regions all over the world.

In the modern era escalation of technology and socioeconomic status of the people are responsible for less physical activity and greater use of tobacco and alcohol by them than before.

With this background, present study has been undertaken to observe the occurrence of hypertension in rural and urban area of Rewa district, and to explore the risk factor associated with the hypertension and also measures were taken to make awareness to prevent and control its progression.

Materials and Methods

This prospective observational study is conducted in department of Pharmacology of S.S. Medical College and associated S.G.M. hospital, Rewa from June 2004 to October 2005. A total of 148 patients with the age ranges from 25 to >65 years (mean age = 45 ± 12 SD years) attending the Out Patient Department during the study period. Our Patients belongs to rural as well as urban area. Patients who have history of rheumatic heart disease, stroke, recent myocardial infarction (<6 month duration), allergic reaction to the antihypertensive drugs, systolic hypertension >200 mm of Hg were excluded from the study. Anthropometric measurements like height, weight, waist and hip circumference were recorded as per World Health Organization (WHO) guidelines^[14]. BMI was calculated by using height and weight ($BMI = \text{weight in kilogram} / \text{height}^2$ in meter) of the patients and results are categorized as follows:

- i. Underweight (UW) : <18.5
- ii. Normal weight (NW): 18.5–24.99
- iii. Overweight (OW): ≥ 25.00 –29.99
- iv. Obesity (OB): ≥ 30.00

Routine hematological (CBC) & biochemical Investigations (Blood Urea, Serum Creatinine, serum Cholesterol), ECG, Chest X-Ray, Echocardiography and TMT were done before start and at the end of study.

A written informed consent was taken prior to start the study from all the participants. During the study period blood pressure of all the selected patients was recorded monthly up to the period of 6 months by standard mercury sphygmomanometer and simultaneous measures were taken to improve their raised blood pressure. A standardized questionnaire was used to study the socioeconomic, demographic and self health awareness for the hypertension.

Data is summarized and compared statistically by frequency distribution and percentage proportion. Chi square test and students t-test were applied to know the significant (*p* value) ratio of difference statistically by using software EpiCalc 2000.

Result

In the present study, we found, that higher frequency of HTN was reported in urban population 60.13% (n=89/148) while 39.86%

(n=59/148) patients belong to rural area which is statistically significant (p -value= 0.042765), Figure 1 (D).

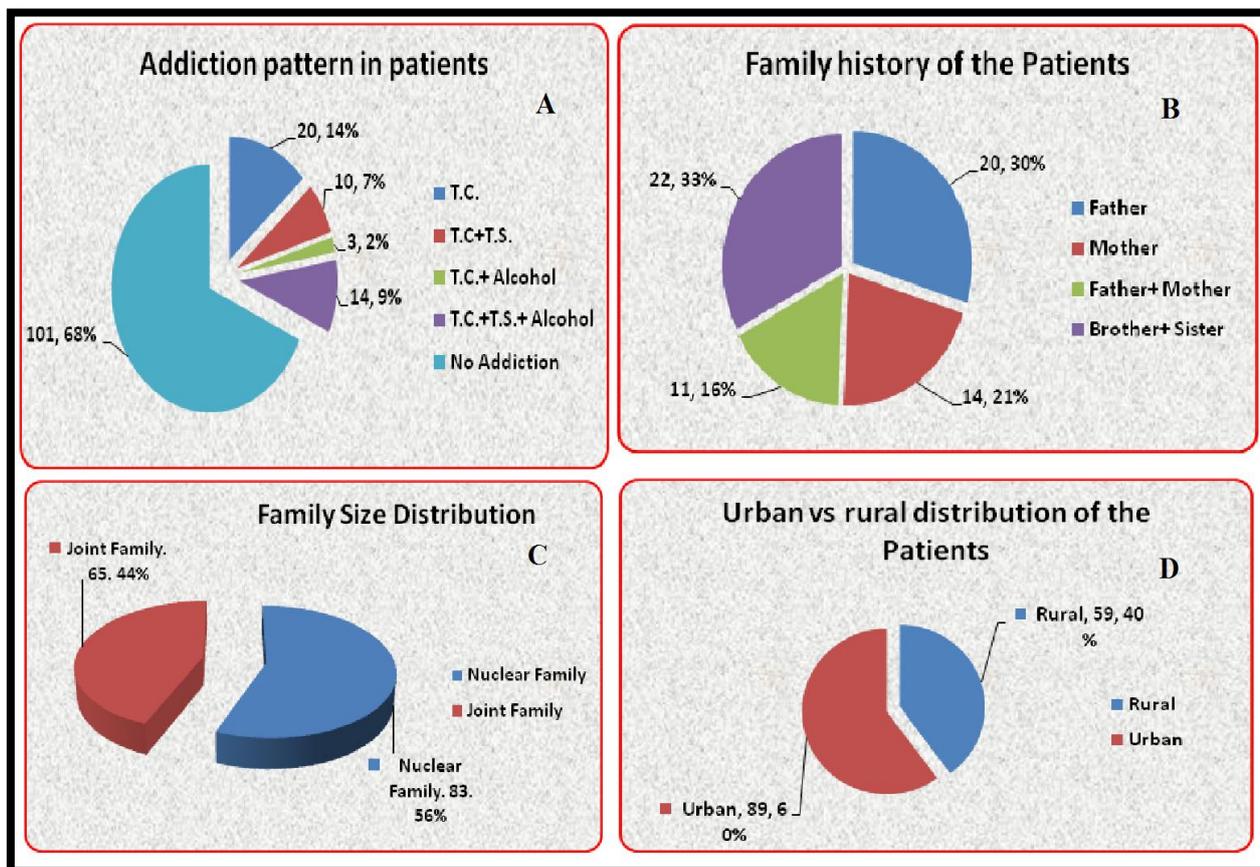


Figure 1 A, B, C &D. Different factors associated with patients

We found in the study that multivariate factors were associated with the progression of hypertension in the urban population. In the present study we found that male patients with the age group between 35-44 years (n=24/148, 16.22%) irrespective of their residence

(rural/urban) had developed hypertension while the female patients with the age group between 45-54 years (n=27/148, 18.24%) and in the study male and female patients those developed hypertension were 54.72% (n=81/148) and 45.27%(n=67/148) respectively, Table 1.

Table 1: Age and Sex Wise Distribution of Cases

Age Group → Sex ↓	25-34	35-44	45-54	55-64	>65	Total
Male	11	24	15	18	13	81
Female	5	22	27	8	5	67
Total	16	46	42	26	18	148
%	10.81%	31.08%	28.37%	17.56%	12.16%	100%

In our study patients who belong to nuclear family (n=83/148, 56.08%) have more risk to develop hypertension as compare to those living in joint

family (n=65/148, 43.91%) (p = 0.22), Figure 1 (C).

The present study has also proved that those patients whom had a family history of hypertension were prone to develop hypertension, figure 1 (B). In the present study 7.43% patients (n=11/148) had both mother and father hypertensive while 14.86% patients (n=22/148), both brother and sister had hypertension (p -value = 0.000001).

The present study also showed that 50.7% hypertensive patients (n=75/148,) had increased Body Mass Index (BMI) while 47.29% (n=70/148) had normal BMI and only 2.03% (n=3/148) patients were found under weight (p -value = 0.000001) as shown in Table 2.

Table-2: Distribution of cases according to BMI

BMI	patient	Percentage (%)
<18.5	3	2.03
18.5-24.9	70	47.29
25-29.9	61	41.21
>30	14	9.46

In the present study we found that tobacco in the form of chewing and smoking (n=10/148, 6.75%) associated with hypertensive patients and 31.76% (n=47/148) patients had addiction of tobacco chewing, tobacco smoking and alcohol drinking collectively while rest of the patients (n=101/148, 68.24%) had devoid of any type of addiction, statistically significant (p = 0.000001),figure 1 (A).

In the present study Diabetes Mellitus (n=11/148, 7.43%) was associated more frequently with the Hypertension while the least association seen with the Ischemic Heart Disease (IHD); (n=1/148, 0.67%) and combination with DM with IHD i.e.0.67% (p -value = 0.000001) as shown inTable-3.

Table 3: Hypertension associated with other diseases

Disease	Total n=148	
	Total	Percentage %
HT	37	25
DM	11	7.43
IHD	1	0.67
HT+DM	3	2.02
HT+IHD	5	3.37
HT+DM+IHD	1	0.67
No H/o of HT+DM+IHD	90	60.81

In our study we found that a total of 148 patients; 73.64% patients (n=109/148) were newly diagnosed with hypertension while 26.35% patients (n=39/148) were had have hypertension prior to taken for study (P -value = 0.042765) as shown in Table 4.

Table 4: Distribution of Old and new cases in the study

	Total n=148	Percentage (%)
Newly patients	109	73.64
Old patients	39	26.35

Discussion

India is a developing country and like other developing country it is going through a rapid demographic and epidemiological evolution, due to which the prevalence of hypertension is increasing rapidly. Alteration in lifestyle may be the major factor leading to this increasing prevalence of HTN and other cardiovascular risk factors.^[15,16,17]

In the present study data is collected from the hospital which includes the patients, who attend the Out Patient Department (OPD) during the study period. The present study reveal that the occurrence of hypertension is more in urban region(60.13%) as compare to the rural (39.86%) of Rewa district. In our study we found that most of the patients were newly diagnosed/registered (n=109/148, 73.64%) hypertensive compare to the old hypertensive (n=39/148, 26.35%) and they belong to the age group 35-54 years and most of them living in urban region. This increased risk is most probably due to more intellectual work and less physical activity execute in the advanced infrastructural set up of people living in urban region; to overcome with the problem now a day many company they provide facility of gym to their workers. A similarly reported by S.M. Abebe et al^[18], M.E. Hendriks et al^[19] and N. Kodaman et al^[20].

In the present study we found that the most common age group affected by the hypertension was 35-54 years with female preponderance (n=49/88, 55.68%) compare to the male (n=39/88, 44.32%) in the age group mentioned; this increase

risk of hypertension in the younger age group is due to stress in the employment field area. A separate study in India by Prabhakaran D. et al reported highest increase in prevalence of hypertension in the youngest age group (35–44 years) surveyed⁽²¹⁾. A study among the young individuals (20–30 years) from South India revealed a very high burden of 45.2% of pre-hypertension in the population^[22]. The rapid rise of hypertension in young individual is worrisome and calls for taking action, like salt reduction, increase physical activity and weight reduction to control and prevention of hypertension.

In the present study we found that people living in nuclear family are more prone to develop HT than those living in joint family although it is statistically insignificant ($p=0.22$), similarly reported by Momin M.H. et al^[23]

In the present study there is a positive association of HT where either both parents or siblings have hypertension; similarly reported by Todkar S.S. et al^[24], Subburam R et al^[25] and Divan V et al^[26] parental history of HTN was found to be significantly associated with high BP^{[24][25][26]}.

It is shown in our study that BMI has associated with increased risk of development of hypertension. Similar finding is reported across most studies in India and abroad by Culter JA et al^[27], Menendez E et al^[28] and Bhadoria AS et al^[29].

As per WHO report, alcohol consumption was the third largest risk factor in the developed countries and tobacco use was being the second major cause of death worldwide^[30]. That further indicated the positive association between alcohol and tobacco use and hypertension. Our study revealed that tobacco in the form of chewing and smoking is associated with development of hypertension in only 6.75% while tobacco when combined with alcohol are associated with 31.76% risk of HT development. A similar study was also reported by Reddy S.S. et al^[31], Dhungana R.R. et al^[32], Wamala J.F. et al^[33] and Kishore J. et al^[34]. But there are several other studies reported by Erem C. et al^[35], Costa et al^[36] and Peltzer K. et al^[37] with

paradoxical findings. Limited data from South Asia suggests higher blood pressure levels in alcohol users^[38].

Conclusion

The present study reveals the higher occurrence of hypertension seen in urban population than rural because of; urbanization, less physical activity, changes in life style, obesity and bad practice (addiction) and small family size were the main reason. To educate people about the drawbacks of increased salt in diet, obesity, to overcome from stress and life style modification could be helpful in reducing the risk of hypertension in the region of Rewa district.

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