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Original Research Article

Comparative prevalence study of hypertensive patients between rural and urban population in Lucknow

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ABSTRACT

Background: Hypertension (HTN) is one of the most frequent leading cause of cardiovascular diseases and an important reason for morbidity and mortality worldwide. Because of the change in lifestyle and urbanization, many countries now have an increased prevalence of hypertension. In Uttar Pradesh, studies on hypertension in urban and rural communities are scarce. Hence the aim of this study is a comparison of the prevalence of hypertension between rural and urban areas.
Material and Methods: A cross-sectional study was performed from 16th January to 20 January 2017 for rural populations and from 13th July 2017 to 15th July 2017 for urban populations to compare the occurrence of hypertension in rural and urban population. Hypertension was identified according to JNC VIII criteria.
Results: Hypertensive subjects were more prevalent in urban (33%) than rural (17%) area. The incidence was found to gradually increase with age. There were more overweight and obese peoples found in the urban population than the rural population. Along with urban hypertensives, 75.7% showed a sedentary lifestyle, and in rural 58.8%, hypertensives showed a sedentary lifestyle.
Conclusion: Higher prevalence of hypertension was found in an urban area. Majority of hypertensive had a sedentary lifestyle in both rural and urban areas.

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INTRODUCTION

Hypertension is a silent killer which leads to cardiovascular diseases. Cardiovascular diseases are one of the most worldwide public health problems, affecting both developed and developing countries (Akiko et al., 2008; Kirk et al., 2017). Major deaths in developing countries were due to the complication of hypertension (Cooper et al., 2009; WHO 1972). In the past decades, hypertension has become the fifth most important risk factor for deficient health in developing countries (Ahmad et al., 2014). Because of the change in lifestyle and urbanization, many countries now have an increased prevalence of hypertension (Lars et al., 2004). India is not spared from this problem. Our study aimed to estimate the prevalence and identify the risk factors of hypertension among adults aged 15 years and older in an urban (Lucknow City, Nishatganj) and rural area (Sansarpur, Dasauli). Hypertension is one of the main risk factors of cardiovascular diseases. In Uttar Pradesh, studies on hypertension in urban and rural communities are scarce. Hence the aim of this study is a comparison of the prevalence of hypertension between rural and urban areas.

As arterial blood pressure is a continuous variable, it is impossible to define a cut-off point below which the blood pressure is normal and above which the blood

pressure is abnormally high. Nevertheless, evidence from epidemiological studies clearly indicates a strong correlation between blood pressure and cardiovascular morbidity and mortality (Kaplan, 1986).

Hypertension has been defined arbitrarily as a systolic blood pressure greater than 140 mm Hg or diastolic pressure greater than 90 mm Hg (JNC VIII, 2014; Beevers et al., 2001).

Classification of Hypertension according to JNC VIII guidelines.

Type of Hypertension	Systolic BP	Diastolic BP
Normal BP	<120	<85
Pre Hypertension	121 – 139	86 – 89
Stage I Hypertension	140 – 159	90 – 99
Stage II Hypertension	≥160	≥100

Between 10% and 25% of the population are expected to benefit from drug treatment of hypertension, the exact figure depending on the cut-off value for blood pressure and the age group considered for active treatment (Chobanian et al., 2003; David et al., 2007).

In 90-95% of cases of hypertension, there is no underlying medical illness to cause an increase in B.P., This is termed essential hypertension. The etiology of essential hypertension tends to runs in families (Barzilay et al., 2004; Niels et al., 2009; Zanchetti et al., 2001).

Genetic factors account for about one-third of the blood pressure variation between individuals although no single gene appears to be responsible except in some rare disease processes (Nora et al., 2014; Vasilios et al., 2009).

Blood pressure increases with age in westernized societies and hypertension is therefore substantially more common in elderly subjects. It is also more common in people of African and Caribbean origin, who are also at particular risk of stroke and renal failure. Hypertension is exacerbated by other factors for example high salt or alcohol intake or obesity (Meyboom et al., 1992).

According to national health and nutritional examination survey (phase 1, 2, 1988-1994), prevalence of hypertension was found in 19.3% among white women, 24.4% among white men, 4.2% among black women, 35.0% among black men, 22.0% among Mexican –American women, and 25.2% among Mexican American men (DeShazo et al., 1997; Joseph et al., 2002; Royal et al., 1997).

Blood pressure values continue to increase with age and hypertension is very common in the elderly, however, most patients are diagnosed with hypertension during the 3rd, 4th and 5th decades of life. Up to the age of 55 years, more men than women have hypertension. From the age of 55 to74, slightly more women have hypertension than men, with these sex differences becoming quite clear in the very elderly (> 75 years). In the older population (age >60 years), the prevalence of hypertension is above 60% (Kessler et al., 1993; Melvin et al., 2007).

The cardiovascular risk associated with given blood pressure is dependent upon the combination of risk factors in the specific individuals. These include Age, gender, weight, physical inactivity, smoking, family history, blood cholesterol, diabetes mellitus and pre-existing vascular disease (Ahmad et al., 2013; Stephens et al., 1998).

Effective management of hypertension, therefore, requires a holistic approach that is based on the identification of those at highest cardiovascular risk and the adoption of multifactor interventions, targeting not only Blood Pressure (B.P.) but all modifiable cardiovascular risk factors.

Aim of this study is the comparison of the prevalence of hypertension between rural and urban areas. The primary objective of this study is to assess the effect of different environment and lifestyle on the incidence of hypertension.

METHODOLOGY

Study Design

Study Site: The study site is divided into two geographical areas:

1. Rural area (Sansarpur, Dasauli) of Lucknow
2. Urban (Lucknow city, Nishatganj) area of Lucknow

Inclusion Criteria

1. All the persons of rural and urban areas attending an observation study were included
2. The entire patient irrespective of age and sex.
3. All the pregnant patients undergoing treatment in medicine OPD were also in this study.
4. All the patients newly prescribed with an antihypertensive drug
5. All the patients already receiving antihypertensive drug before the start of the study.

Exclusion Criteria

1. All the mentally retarded and unconscious patients.
2. Patients were unable to report to verbal question.
3. Individuals who were not available at the time of visits.

Study population and setting

A prevalence study was conducted among adults aged 15 years and above in urban (Lucknow city, Nishatganj) and rural area (Sansarpur, Dasauli).

Community analysis

Trained Pharm. D students with the support of local leaders conducted a door to door observation. When a visit was made, the head of the household provided informed consent to collect demographic information about all household members. A unique household identifier was given to each household to identify inhabitants in the urban (Lucknow city, Nishatganj) and rural area (Sansarpur, Dasauli), Lucknow.

Data collection

In addition to the questionnaire used for the survey, participants in the hypertension survey were also submitted to another standardized questionnaire on risk factors for hypertension. The questionnaire administration and blood pressure measurements were carried out by trained interviewers from 16th January to 20th January 2017 for rural populations and from 13th July 2017 to 15th July 2017 for urban populations. Data collection was conducted every day including weekends and evenings when people were more likely to be found at home. A person who at the time of survey smokes any tobacco product either day by day or occasionally was considered as a smoker. A non-smoker is somebody who at the time survey does not smoke at all. Physical activity was observed based on the occupation of participants, and spare time activity was not considered.

(A) Sedentary: (1) Male: Barber, Tailor, Teacher, clerics, Retired person, Land-lord, Peon, Postmaster. (2) Female: Nurse, Tailor, Teacher, Executive, House-wife.

(B) Moderate: (1) Male: Potter, Fisherman, Basketmaker, Goldsmith, Agriculture, Carpenter, labor, Mason, Rickshaw puller, Electrician, Fitter, Turner, Welder, Industrial labor, Coolie,

Weaver, Driver. (2) Female: Basket-maker, Maidservant, Weaver, Agriculture labor

(C) Heavy: (1) Male: Gangman, Blacksmith, Mineworker, Woodcutter (2) Female: Stonecutter.

RESULTS

Prevalence of hypertension in the rural and urban study population.

Total of 100 subjects from urban and 100 from the rural area was assessed. Hypertension was present in 33% of subjects in an urban area and 17% in a rural area (Table 1).

Rural and Urban division of subjects by blood pressure status and age groups

The prevalence of hypertension was observed to regularly increase with age. In the 15-29 years, age group the prevalence was 1%. in an urban area and 0% in a rural area, which deliberately increased to 66% and 36% respectively, among those aged between 50-59 yrs. Hypertension prevalence was increased sharply in the fourth decade among urban subjects as compared to the fifth decade among rural subjects (Table-2).

Urban and Rural distribution of subjects by blood pressure status and gender

The study population involved of 32.6% male and 33.3% females in an urban area while 17% males and 16.9% females in a rural area (Table 3). Among hypertensive, majority of them had no presenting complaints. The most common complaint was a headache in hypertensive of both populations followed by giddiness and palpitation.

Urban and rural distribution on the basis of family history and awareness.

Among urban hypertensive 55% had a family history of hypertension, whereas only 15% had a family history of hypertension in a rural area. Among 33 urban hypertensives who were aware of their hypertensive status, 25 (75.75%) were on treatment among 17 rural hypertensive, who were aware of their hypertensive status, 9 (53%) were on anti-hypertensive treatment (Table 5).

Urban and rural distribution of hypertensive according to physical activity

Among urban hypertensive, 75.7% led a sedentary lifestyle, while 21. 2% were moderate workers and 3% of subjects were heavy workers (Table 5).

Among rural hypertensive, 58.8% led a sedentary lifestyle while 35.2% were moderate workers and 11.8 % subjects were heavy workers (Table 4). Prevalence of smoking among urban hypertensive was 12% and in rural hypertensive were 15%.

Urban and rural distribution on the basis of smoking, alcohol and tobacco consumption.

Among urban hypertensive, 13% consumed smokeless tobacco whereas among rural hypertensive proportion was 31%. Out of 33 urban hypertensive, 6 (18%) consumed alcohol whereas out of 17 rural hypertensive, 3 (17%) consumed alcohol.

Urban and rural distribution on the basis of stress, overweight and obesity.

Stress was present in 28% of urban and 8% of rural hypertensive. Among urban hypertensive, 49% were overweight (BMI 25- 29.99) and 13% were obese (BMI ≥30.00). Among rural hypertensive, 18% were overweight and 3% were obese.

Table 1: Prevalence of hypertension in urban and rural study population.

Residence	Total	Hypertensive (%)	Normotensive (%)
Urban	100	33 (33%)	67
Rural	100	17 (17%)	83
Total	200	50 (25%)	150

Table 2: Urban and Rural distribution of subjects by blood pressure status and age groups.

Age group (Years)	Urban		Rural		P value
	Total	Hypert-ensive (%)	Total	Hypert-ensive (%)	
15-29	20	1(5%)	19	0(0%	0.1
30-39	25	4(16%)	23	0(0%)	0.06
40-49	24	8(33%)	25	5(20%)	0.07
50-59	24	16(66%)	25	9(36%)	0.04
≥60	7	4(57%)	8	3(37%)	0.1
Total	100	33(33%)	100	17(17%)	0.01

Table 3: Urban and Rural distribution of subjects by blood pressure status and gender.

Sex	Urban (%)		Rural (%)		P value
	Total	Hypertensive	Total	Hypertensive	
Male	49	16(32.6%)	47	8(17%)	0.01
Fem.	51	17(33.3%)	53	9 (16.9 %)	0.007
Total	100	33 (33%)	100	17 (17%)	0.006

Table 4: Urban and rural distribution of hypertensive according to physical activity

Physical activity	Urban (n=33) (%)	Rural (n=17) (%)	Total (n=50) (%)	P value
Sedentary	25(75.7)	10(58.8)	34(68)	0.001
Moderate	7(21.2)	5(35.2)	13(26)	0.09
Heavy	1(3.1)	2((11.8)	3(6)	0.1

Table 5: Urban and rural distribution on the basis of family history and awareness.

Residence	Family history of hypertension	Awareness of hypertension
Urban	55%	75.75%
Rural	15%	53%

Table 6. Urban and rural distribution on the basis of smoking, alcohol and tobacco consumption.

Residence	Smoking	Tobacco consumption	Alcohol consumption
Urban	55%	75.75%	18%
Rural	15%	53%	17%

Table 7: Urban and rural distribution on the basis of stress, overweight and obesity.

Residence	Stress	Overweight	Obese
Urban	28%	49%	13%
Rural	8%	18%	3%

DISCUSSION

In this study, it was found that hypertension is more significantly prevalent in the urban population (33%) than rural population (17 %). These results were supported by the report obtained by Gupta (Gupta, 2004). The prevalence of hypertension has been mentioned to range between 20-40% in urban adults and 12-17% among rural adults according to this study. It was observed that older age to be an important non-modifiable risk factor for the progress of hypertension. Prevalence of hypertension was found to increase steadily with age in both urban and rural population. A sharp increase in hypertension prevalence was observed in the age group 50-59 years among urban subjects as compared to the age group 50-59 years among rural subjects.

There was a significant difference in the prevalence of hypertension found for the age groups 40-49 years and 50-59 years in urban-rural populations.

According to various observational studies, a positive relationship between age and blood pressure was established.

There was no significant difference found in the prevalence of hypertension between males and females in both urban and rural areas. These observations were supported by the studies done by Hussain et al. (1988) in northwest Rajasthan who found no difference in the prevalence between males & females (Hussain et al., 1988; Roger et al., 2003).

Hypertension among urban males was more ubiquitous than rural males in this study. In the same way, the prevalence of hypertension among urban female was more than rural female.

In our study, it was found that sedentary lifestyle occupation has a high risk of prevalence of hypertension in both urban and rural area. All these occupations have a sedentary type of job and higher mental stress as a common factor which may a contributory factor in the development of hypertension.

In both urban and rural areas, the prevalence of hypertension was low in people involved in high physical activity.

According to this study, it was observed that 75.7% urban and 58.8% rural hypertensive led a sedentary

lifestyle. Higher occurrence of sedentary lifestyle between the urban hypertensive could be due to the fact that they involve more intellectual but less physical work. On the opposite, in the rural group most of the occupation in the fields, which involve more physical activity.

It was observed that stress was present in 28% of urban and 8% of rural hypertensive. Urban hypertensive was significantly more stressful when compared to their rural areas.

It was found in this study that 49% of urban hypertensive had a BMI of ≥25 kg/m^2 whereas only 18% of rural hypertensive had a BMI of ≥25 kg/m^2. Hence Urban hypertensive were more overweight (≥25 kg/m^2) as compared with rural populations because of their sedentary lifestyle.

According to various research studies it was established that overweight or obesity is a metabolic syndrome which is associated with a high risk of developing hypertension. For each 10% enhance in weight an elevation of 6. 5 mm Hg in systolic pressure was observed in the Framingham studies (Karch et al., 1997; Kurokawa et al., 2000).

CONCLUSION

This study concludes that hypertension is a serious public health issue. Hypertension is more prevalent in an urban area. Most hypertensive patients had a sedentary lifestyle in both rural and urban areas. Lifestyle modification is needed for the prevention of hypertension.
There is a need for prospective studies in a large population to identify specific risk factors of the disease in this country so as to enable the development of control and intervention programs in a population with an underlying predisposition to hypertension.

CONFLICT OF INTEREST

None declared.

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