



A BIOCHEMICAL APPROACH TO RISK FACTORS OF HYPERTENSION PREVALENT AMONG URBAN AND RURAL POPULATIONS OF DISTRICT-HAPUR .

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ABSTRACT

Introduction: The Global Burden of Diseases study has reported that hypertension is the most important cardiovascular risk factor in this region and responsible for the largest burden of disease and mortality (10). Present estimates suggest that a 2 mm Hg population-wide decrease in systolic BP can lead to prevention of more than 151,000 stroke and 153,000 coronary heart disease deaths in India (10). Hypertension is the new era pandemic which is the leading cause of mortality in the world and is ranked third as a cause of disability-adjusted life years. Various risk factors are implicated in the development of hypertension and there are differences in these risk factors in urban and rural populations depending on the level of development and epidemiological transition.

Aims & Objective: The aim and objectives of the study were to estimate and compare the prevalence of hypertension among urban and Rural population; and to assess the factors associated with Hypertension among the study population .The present study will estimate the prevalence of hypertension and identify & compare some socio-demographic and lifestyle risk factors associated with hypertension in urban and rural populations of Hapur.

Materials And Methods: The present study was a across-sectional study conducted in Saraswathi institute of medical Sciences, district Hapur. Hapur is a small town in western U.P. Study included a total of 300 subjects from urban and rural population of Hapur. Individuals greater than 18 years of age were included. Data regarding basic demographic characteristics were collected along with anthropometric measurements including height and weight. They were randomly selected from urban and rural populations of Hapur using modified cluster sampling method. Three Blood Pressure readings were recorded using mercury sphygmomanometer in the sitting position and the mean of two was considered for analysis. Data entry and analysis was done using SPSS 20 for windows version 8.1.

Result: The prevalence of hypertension was high in urban area (31.4%). Though prevalence of hypertension in rural area is low when compared to urban, it can be observed that it is increasing over time to match the urban rate. Most of the study population belonged to age group of 20–29 yrs (27.5%) followed by 30–39 yrs (24.5%). 41.2% of the study population was constituted by males and the rest 58.8% by females. The prevalence of hypertension was 21% in the present study, which is comparable to the estimates given by World Health Organization (23%). Around 33.7% of the population had blood pressure in the normal range and 45.3% of the population had pre-hypertension. The prevalence of hypertension was 23.7% in the urban areas and 18.3% in the rural areas. This difference was found to be statistically insignificant.

Conclusion: A no. of risk factors were attributed for the development of hypertension – increasing age, sedentary occupation, higher socio-economic status, extra salt intake, family history of hypertension, reduced physical activity, tobacco smoking, smokeless tobacco consumption, alcohol consumption, BMI \geq 25 and high waist-hip ratio.

KEYWORDS : Hypertension, stroke, risk factors, population .

Introduction

The Global Burden of Diseases study has reported that hypertension is the most important cardiovascular risk factor in this region and responsible for the largest burden of disease and mortality (10). Hypertension is the new era pandemic which is the leading cause of mortality in the world and is ranked third as a cause of disability-adjusted life years.[1] The World Health Organization and the seventh report of the 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 140 mmHg and/or diastolic blood pressure more than or equal to 90 mmHg.[2,3] .Since then prevalence of hypertension in Indian cities has been steadily increasing from 3.0-4.5% in early 1960's to 11.0 to 15.5% in mid 1990's. .People with hypertension possess two fold higher risk of developing coronary artery disease, four times higher risk of congestive heart failure and seven times higher risk of cerebrovascular disease compared to normotensive people.[9,10] . Cardiovascular disease is a model of chronic degenerative disease, and at present is the leading cause of death worldwide, accounting for >15 million deaths each year (1). According to 2020 WHO projections, Hypertension and its complications, will be the most important cause of morbidity and death worldwide, with high costs to health-care systems. Because of changes in life style, changes in environment and increased life expectancy the problem of hypertension is on the rise. Recent data suggests that non-communicable diseases are already the commonest cause of death in many parts of rural India.[20,22] . The goal BP as recommended by WHO/ISH, ESH/ESC, JNC-7 HPT report of US and GSTG of MOH, is that both systolic and diastolic BPs, be lowered intensively to at least below 140/90 mmHg and to lower values if tolerated, in all Hypertension patients, and to below 130/80

mmHg in diabetics (16). The actual burden of Hypertension in urban and rural India is often under estimated. Most of the cases go undetected and the patient's untreated leading to complications. There is a felt need to define actual burden of the disease and to determine the geographic differences in the prevalence of hypertension and the risk factors associated with it. Hypertension it is readily detectable, easily treatable condition and if left untreated may leads to serious complications7. In considerable proportion of cases the disease tends to be asymptomatic for prolonged time, hence also labelled as '**Silent Killer**'. Hypertension is also considered as an '**Iceberg**' disease' because unknown morbidity far exceeds the known morbidity. Estimation of hypertension prevalence is therefore necessary to plan effective control measures. There is need for community based study in urban and rural population in view to determine the geographic differences in the prevalence of hypertension and the various risk factors.

Risk Factors

There are various risk factors associated with hypertension; some of the known risk factors for primary hypertension like age, heredity, and gender are non-modifiable. However, the majority of the other risk factors like tobacco use, alcohol use, unhealthy diet, physical inactivity, overweight and obesity can be effectively prevented.[24] There are differences in these risk factors in urban and rural populations depending on the level of development and epidemiological transition. The control of hypertension will require modification of its risk factors and hence necessitates identifying the various risk factors associated with hypertension in the urban and rural populations of India. Thus, burden of hypertension in these populations might be underestimated and might leave the disease undiagnosed and untreated. Estimating the prevalence of

hypertension and its risk factors in both the urban and rural populations is very crucial as this forms the basis for planning of primary and secondary prevention of hypertension. Hence this field based cross-sectional study was undertaken.

Aims and Objectives

- To estimate and compare the prevalence of hypertension among urban and rural population; and to assess the factors associated with Hypertension among the study population
- To identify and compare some socio-demographic and lifestyle risk factors associated with hypertension in urban and rural populations of Uttar Pradesh.

MATERIALS AND METHOD

Study Design

The present study is a Randomized, Prospective and Comparative study in Saraswati Institute of Medical Sciences and Hospital, Hapur (UP).

Study Area:

The study was conducted in District Hapur (UP), India.

Study Period:

The study was conducted from August 2017 to Nov 2018.

Study Setting:

The study was carried out from the patients being referred to the Department of General Medicine, Saraswati Institute of Medical Sciences and Hospital, Hapur (Uttar Pradesh).

Study Population:

A total of 120 individuals were recruited in the study. In the present series, the subjects were diagnosed with hypertension with no further immediate medical complications. : The study was carried out in urban and rural field practice area of Hapur and Pilkhuwa. All the people with age group 20 years and above living in the study area were eligible to participate in the study.

SELECTION OF CASES

Inclusion Criteria:

1. Adult patients (aged 18 years or more) reporting first time/regularly associated with SIMS hospital for management of Hypertension issue are selected.
2. Only mild to moderate grade hypertensive patients were taken
3. Patients consenting for the study

Exclusion Criteria:

Cases with the following findings will be excluded:

1. Complicated/Unregulated Blood pressure
2. Patients with history of drug abuse history or history of psychiatric disorder
3. Other factors causing hypertension
4. Cancer or suspicion of malignancy
5. Patients with renal failure
6. Patients with pedal oedema and patient with fluid overload
7. Patients with known kidney disease
8. Patients on hemodialysis
9. Pregnancy
10. Angina
11. Hypertensive emergency

Study Population (Sample size):

The sample size was calculated using the probability sampling formula below:

$$N = Z^2 pq / d^2$$

Where, n = sample size

z = statistical certainty chosen

p = proportion of hypothyroid individuals with hypertension

q = 1 - p

d = precision desired.

Ethical Approval:

Ethical Approval was taken from the Institutional Ethical Committee after explaining the Aim and Objectives of the Study.

Informed Consent:

A written Informed Consent was obtained from each patient before starting the procedure. The involvement of the subject was voluntary

and deliberate.

Study Population:

Study was carried out in urban and rural field practice area of Hapur and Pilkhuwa. All the people with age group 20 years and above living in the study area were eligible to participate in the study. A written Informed Consent was obtained from each patient before starting the procedure. The involvement of the subject was voluntary and deliberate.

Tools used in collection of data:

Pre-tested semi-structured Questionnaire to assess:

- ❖ Socio-demographic characteristics of the study participants.
- ❖ General physical and CVS examination in study subjects.
- ❖ Risk factors associated with Hypertension.

Statistical Analysis:

The data collection was tabulated, coded, and analyzed using Microsoft word SPSS for windows version 8.1

Table 1: Distribution Of Study Subjects Based On Jnc-7 Classification

BLOOD PRESSURE CLASSIFICATION	NO.	%
NORMAL	202	33.7
PRE-HYPERTENSION	272	45.3
Stage 1 Hypertension	97	16.2
Stage 2 Hypertension	29	4.8
TOTAL	600	100

Table 2. Prevalance of hypertension in urban and rural study population

Urban	300	69(23%)	231 (77%)
Rural	300	53 (17.6%)	247 (82.33%)
Total	600	122 (20.33)	478 (79.66)

Table 3. Distribution of subjects according to blood pressure status and Age

Age	No.	Hypertensive %	Normotensive %
20-29	165	10(6.06)	155 (93.93)
30-39	150	16 (10.66)	131 (87.33)
40-49	120	27 (21.9)	96 (78.2)
50-59	82	32 (39)	51 (61)
60-69	62	30 (48.4)	32 (51.6)
Up to 70	21	11(52.4)	10 (47.6)
Total	600	126 (21)	474 (79)

Table 4 : Distribution of subjects according to blood pressure status and gender

Gender	No	Hypertensive%	Normotensive%
male	245	58(23.67)	189(77.14)
Female	355	68(19.15)	285(80.28)
Total	600	126(21)	474(79)

Table 5 :Urban and rural distribution of subjects by blood pressure and gender

	No.	URBAN	No	RURAL (HTN%)
Male	120	32(26.4)	126	26(20.6)
Female	180	39(21.8)	174	29(16.7)
Total	300	71(23.7)	300	55(18.3)

Discussion

The present study was conducted to estimate and compare the prevalence of hypertension in urban and rural populations of Hapur and to identify & compare some socio-demographic and lifestyle risk factors associated with hypertension in urban and rural populations of Hapur. A total of 600 subjects were selected, which included 300 each from urban and rural areas of Hapur respectively. Most of the study population belonged to age group of 20–29 yrs (27.5%) followed by 30–39 yrs (24.5%). 41.2% of the study population was constituted by males and the rest 58.8% by females. Majority of the study population belonged to middle class (58%) followed by upper lower class (18%).

Prevalence of hypertension :

Following JNC-7 and WHO definition of hypertension, the prevalence of hypertension in the present study was 21%. Around

33.7% of the population had blood pressure in the normal range and 45.3% of the population had pre-hypertension. The findings of the study are comparable to WHO estimates which gives a 23% prevalence of hypertension in India.

Prevalence of hypertension in rural areas :

Prevalence of hypertension and pre-hypertension is high in the present study which supports the increasing trend in the rural communities of India which are under the epidemiological transition. The prevalence of hypertension in rural areas was 18.3%. The prevalence rates of the present study differed from those given by Office of Register General of India (10%) and WHO (22.6%)[11,17]. Depending on the rural areas selected and the methodology used other researchers have found a prevalence of hypertension in rural Indian areas ranging from 7% to 19%.

Prevalence of hypertension in urban areas :

Both urban and rural areas in India have been surveyed to estimate the prevalence of hypertension and a number of reviews have highlighted escalating burden of hypertension in India (11). The prevalence of hypertension in urban areas was 23.7%. The prevalence rates were similar to those given by Office of Register General of India (25%) and WHO (23.1%).[11,17]. Based on the difference in the methodology used other researchers have found a prevalence of hypertension in urban Indian areas ranging from 20% to 40%. In the mid-1950s, Indian urban population based epidemiological studies used older World Health Organization (WHO) criteria for diagnosis (known hypertension or BP \geq 160 mm Hg systolic and/or 95 mm Hg diastolic) and reported hypertension prevalence of 1.2 to 4.0% (12). The Global Burden of Diseases study has reported that hypertension is the most important cardiovascular risk factor in this region and responsible for the largest burden of disease and mortality (10). Present estimates suggest that a 2 mm Hg population-wide decrease in systolic BP can lead to prevention of more than 151,000 stroke and 153,000 coronary heart disease deaths in India (10).

Association between hypertension and age :

Isolated systolic hypertension, an elevation in systolic but not diastolic pressure, is the most prevalent type of hypertension in those aged 50 or over, occurring either de novo or as a development after a long period of systolic-diastolic hypertension with or without treatment. It is known from various studies that rising blood pressure is associated with increased cardiovascular risk. The present study found increasing age to be an important non-modifiable risk factor for the development of hypertension. The prevalence of hypertension was 6% in the age group of 20 – 29 yrs, which increased to 52.4% for people of aged \geq 70 yrs. There was a sharp increase in the prevalence of hypertension after the age of 50 years. The increase in blood pressure with age was found to be similar in both the urban and rural areas. The main reason for increase in blood pressure with increase in age is that arteries and arterioles become less elastic due to atherosclerotic changes as people age advances. Changes in lifestyle and stress are also important contributors. Almost all the studies done to identify the risk factors of hypertension have inferred that age is a significant risk factor for the development of hypertension. The prevalence of hypertension was 12.9% for the age group 25 – 39 yrs which increased to 57.5 % for the age group 55 – 64 years.

Association between hypertension and gender :

Gender differences in hypertension emerge in early adulthood. Our results provide new insights into the origins of gender disparities in both hypertension status and hypertension awareness in several ways. The gender disparities in hypertension status observed during adulthood are already evident when men and women are in their twenties, with women far less likely to be hypertensive compared to men. In the present study males had a higher prevalence of hypertension compared to females. The prevalence of hypertension was 23.5% in males and 19.2% in females, but this difference was found to be statistically insignificant. In urban areas the prevalence of hypertension was 26.4% in males and 21.8% in females. In the rural areas the prevalence of hypertension was 20.6% in males and 16.7% in females. A large number of epidemiological studies have inferred that prevalence of hypertension is more in males as compared to females. This is because; during adolescent and middle aged males have a higher blood pressure compared to females. The female hormones estrogen and progesterone have a protective effect on blood pressure. Later in life this difference diminishes mainly because of the

postmenopausal changes. In the present study thought there is difference in prevalence of hypertension in males and females it is not statistically significant, this is most probably because there were more number of postmenopausal women involved in the study

Conclusion

The prevalence of hypertension was 21% in the present study, which is comparable to the estimates given by World Health Organization (23%). Around 33.7% of the population had blood pressure in the normal range and 45.3% of the population had pre-hypertension. The present study identifies risk factors for the development of hypertension –

- Being overweight or obese
- Too much salt (sodium) in your diet.
- Too little potassium in your diet.
- Not being physically active
- Drinking too much alcohol
- Stress
- Non-steroidal Anti-inflammatory Drugs (NSAIDs)
- Ibuprofen (Advil, Motrin, Ibuprofen) can cause marked worsening of existing hypertension or development of new high blood pressure. Cough and Cold Medications (Sudafed and other brands that contain pseudoephedrine and phenylephrine)
- Cough and cold medicines frequently contain decongestants such as pseudoephedrine and phenylephrine. These medications cause your blood pressure and heart rate to rise, by constricting all your arteries, not just those in your nose.
- Certain chronic conditions also may increase your risk of high blood pressure, including diabetes, kidney disease and sleep apnea.
- A diet low in vitamin D

Source of Support :

Nil, Conflict of Interest: None Declared

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